United States
Department of
Agriculture

Soil
Conservation
Service

In cooperation with
United States Department of the
Interior,
Bureau of Land Management, and
the University of Nevada,
Agricultural Experiment Station

Soil Survey of Eureka County Area, Nevada

How To Use This Soil Survey

General Soil Map

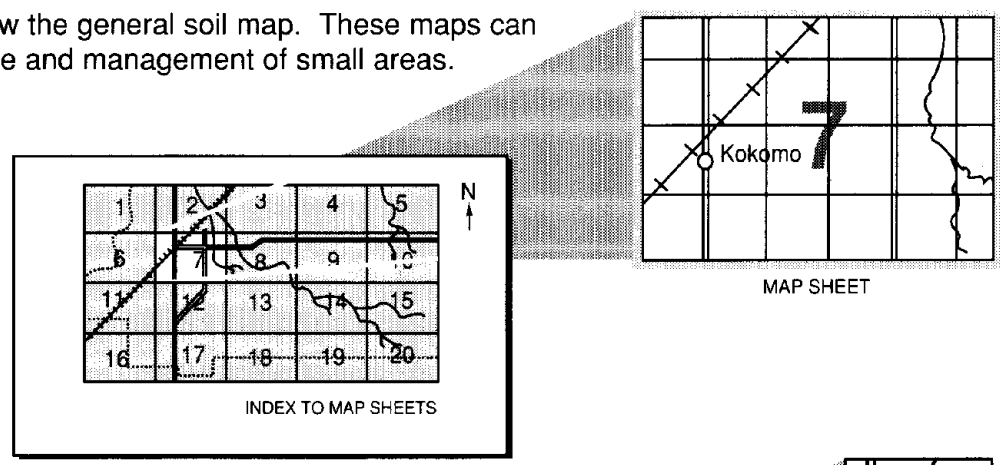
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

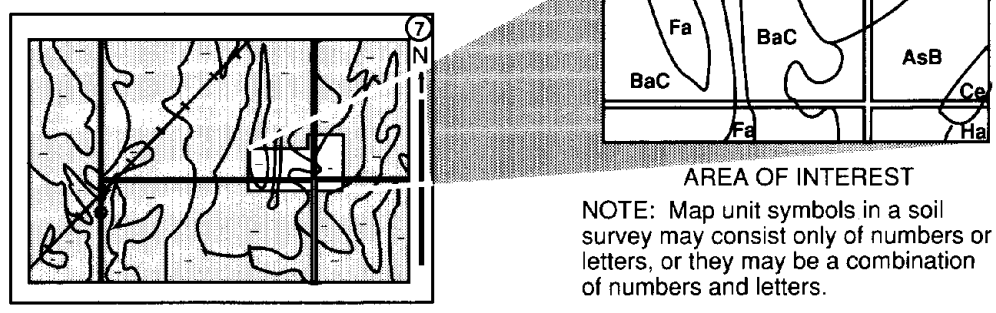
To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



INDEX TO MAP SHEETS

MAP SHEET

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



MAP SHEET

AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, religion, sex, age, marital status, or handicap.

Major fieldwork for this soil survey was completed in 1982. Soil names and descriptions were approved in 1983. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1982. This survey was made cooperatively by the Soil Conservation Service, the Bureau of Land Management, and the University of Nevada, Agricultural Experiment Station. It is part of the technical assistance furnished to the Eureka County Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Contents

Soil Series

Issued July 1989

Index to Map Units

Summary of Tables

Foreword

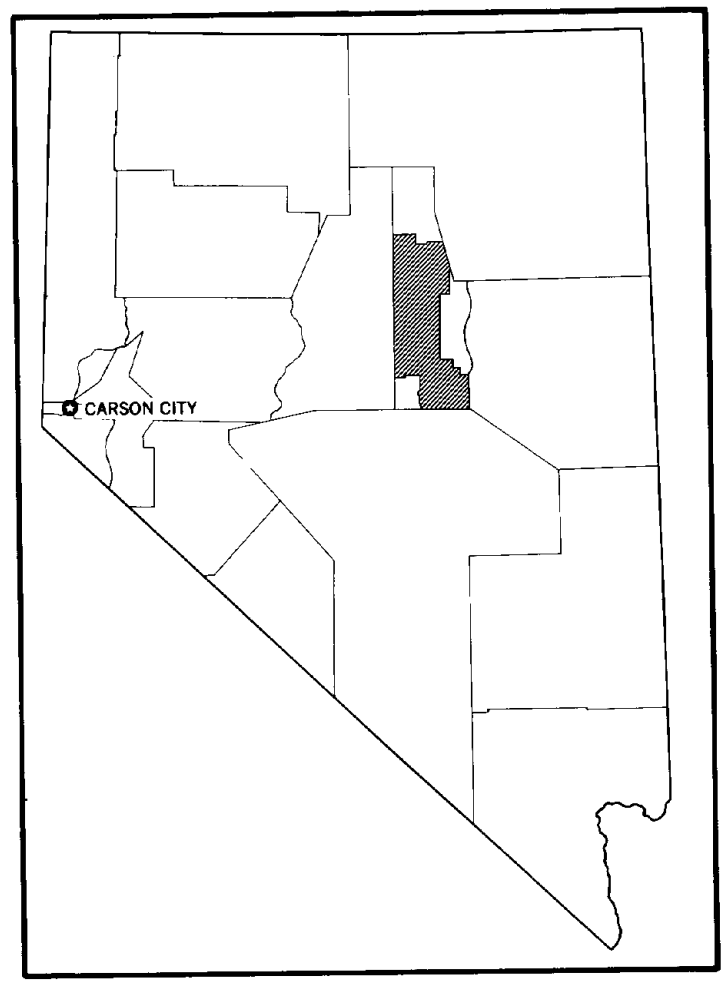
This soil survey contains information that can be used in land-planning programs in Eureka County Area, Nevada. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the suitability of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Charles R. Adams
State Conservationist
Soil Conservation Service



Location of Eureka County Area in Nevada.

Soil Survey of Eureka County Area, Nevada

By Richard A. Foster, Soil Conservation Service

Fieldwork by George J. Staidl and Richard A. Foster,
Soil Conservation Service

United States Department of Agriculture,
Soil Conservation Service,
in cooperation with
United States Department of the Interior,
Bureau of Land Management, and
the University of Nevada,
Agricultural Experiment Station

EUREKA COUNTY AREA is in the north-central part of Nevada. It has a total area of 1,470,948 acres, or 2,298 square miles. The small unincorporated town of Crescent Valley is in the northwestern part of the survey area.

Important physiographic units in the survey area include the Cortez, Simpson Park, and Roberts Mountains; the Fish Creek and Sulphur Spring Ranges; and the Crescent, Pine, Kobeh, Grass, Antelope, Fish Creek, and Garden Valleys. Elevation ranges from about 4,700 feet in Crescent Valley to about 9,000 feet in the Roberts Mountains.

The survey area is sparsely populated. The main industries are ranching and mining. Small areas of irrigated land along Pine, Coils, Roberts, and Fish Creeks are used mainly for the production of hay and pasture.

Descriptions, names, and delineations of soils in this soil survey do not fully agree with those on soil maps for adjacent counties and adjacent parts of Eureka County. Differences are the result of better knowledge of soils, modifications in series concepts, intensity of mapping, or the extent of soils within the survey.

General Nature of the Survey Area

Water Supply

The major sources of irrigation water in the survey area are Pine, Henderson, Denay, Coils, and Fish Creeks. A few wells have been drilled, but they furnish only a small part of the total water supply. At the higher elevations, numerous small springs and seeps and several small perennial streams provide adequate watering facilities for livestock and wildlife. In the valleys, there are few springs and the streams are mostly intermittent; water is provided by wells. The ground water supply in the valleys is quite variable in quality, and the amount that is available for irrigation has not been determined. In the rural areas, water for household use is obtained from drilled wells or from springs.

Industries and Transportation

The main industries in the survey area are ranching and mining. The ranches are dominantly cow-calf

operations, and the current year's production generally is sold in fall and exported. Some operations carry over yearling steers to be sold at a later date. There are also a few herds of sheep in the area.

Meadow hay is the dominant crop grown, but alfalfa is grown in small areas in the Pine Valley area.

Interest in mining has recently increased. The Cortez Gold Mine is an open pit mine at the south end of Crescent Valley, in the Cortez Mountains. The Buckhorn Mine is an old gold mine in the hills at the southwest end of Pine Valley. Mineral Hill, at the southeast end of Pine Valley, is a relatively active lead-silver operation. Windfall Canyon, south of Eureka, has an open pit gold mine. There are also some very small gold and silver mines throughout the Roberts Mountains and Sulphur Spring Range. Oil has recently been discovered at the south end of Pine Valley.

The survey area is so sparsely settled that there is little need for improved roads. In summer and fall most of the survey area is accessible by dirt roads or jeep trails.

There are three main highways in the survey area. State Route 278 runs north-south through Pine Valley, State Route 306 runs north-south through Crescent Valley and Grass Valley, and U.S. Highway 50 runs east-west from Eureka to Austin.

Drainage

The northeastern part of the survey area, consisting of Pine Valley and the surrounding hills and mountains, is drained by Pine Creek and its tributaries, Denay Creek, and Henderson Creek. Pine Creek joins the Humboldt River to the north, outside the survey area.

The southeastern part of the survey area, which includes Fish Creek and Little Smoky Valleys and the surrounding hills and mountains, is drained by Fish Creek and its tributaries. Fish Creek ends in Newark Valley, outside the survey area.

Antelope Valley and the surrounding mountains in the southwestern part of the survey area are drained into Coils Creek by the intermittent Antelope Wash and its many intermittent tributaries.

Kobeh Valley and the surrounding hills and mountains, also in the southwestern part of the survey area, are drained into Diamond Valley, outside the survey area, by Coils Creek and its many intermittent tributaries.

Grass Valley, in the west-central part of the survey area, and Crescent Valley, in the northwestern part, together with the surrounding hills and mountains are drained by many intermittent creeks that end in the valley floors.

Geology

Fish Creek, Kobeh, and Antelope Valleys consist of Quaternary alluvial deposits. Crescent Valley consists of Quaternary alluvial deposits as well as lacustrine deposits. Pine Valley consists of Quaternary alluvial deposits surrounded by Quaternary sedimentary lake deposits.

The Cortez Mountains are composed mainly of Jurassic granitic and volcanic rock with minor amounts of Tertiary tuffaceous sedimentary rock. There are high angle and low angle faults along the Crescent Valley interface and scattered throughout the mountains.

The Roberts Mountains are composed mainly of Ordovician shale and chert and Devonian limestone and dolomite with smaller amounts of Tertiary rhyolite flows. There is low angle faulting throughout the mountains.

The Simpson Park Mountains are mainly Tertiary andesite and rhyolite. There is high angle faulting along the Grass Valley interface.

The Mahogany Hills and the Fish Creek Range are Ordovician and Devonian limestone, dolomite, and shale. There is low angle faulting throughout.

Areas around Antelope Peak are Tertiary ash flow tuffs with much high angle faulting and some low angle faulting.

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

In this survey area, summers are hot, especially at lower elevations, and winters are cold. Precipitation is normally light at lower elevations during all months of the year, and the land is mainly used as rangeland. At higher elevations, precipitation is much greater and snow accumulates to considerable depths. Much of the snowmelt irrigates crops in nearby valleys.

Table 161 gives data on temperature and precipitation for the survey area as recorded at Beowawe, Carlin, and Eureka. Table 162 shows probable dates of the last freeze in spring and the first freeze in fall. Table 163 provides data on length of the growing season.

In winter, the average temperature is 30 degrees F at Beowawe, 28 degrees at Carlin, and 29 degrees at Eureka; the average daily minimum temperature is 17 degrees at Beowawe, 20 degrees at Carlin, and 18 degrees at Eureka. The lowest temperature on record, which occurred at Beowawe on December 11, 1972, is −30 degrees. In summer, the average temperature is 68 degrees at Beowawe and Carlin and 66 degrees at Eureka; the average daily maximum temperature is 88 degrees at Beowawe, 80 degrees at Carlin, and 82 degrees at Eureka. The highest recorded temperature, which occurred at Beowawe on July 27, 1975, is 108 degrees.

Growing degree days are shown in table 161. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees). The normal monthly accumulation is used to schedule single or successive plantings of a crop

between the last freeze in spring and the first freeze in fall.

Of the total annual precipitation, 4 inches, or 50 percent, usually falls in April through September at Beowawe; 6 inches, or 40 percent, at Carlin; and 7 inches, or 50 percent, at Eureka. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 2 inches. The heaviest 1-day rainfall during the period of record was 2.8 inches at Carlin on June 6, 1968. Thunderstorms occur on about 25 days each year, and most occur in summer.

The average seasonal snowfall is 10 inches at Beowawe, 55 inches at Carlin, and 58 inches at Eureka. The greatest snow depth at any one time during the period of record was 14 inches. On an average of 3 days at Beowawe, 58 days at Carlin, and 57 days at Eureka, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year. Every few years a blizzard strikes the area with high winds and drifting snow. Even at lower elevations, snow remains for many weeks and livestock suffers.

The average relative humidity in midafternoon is about 38 percent. Humidity is higher at night, and the average at dawn is about 60 percent. The sun shines 80 percent of the possible time in summer and 70 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 11 miles per hour, in spring.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. The fieldwork in the northern one-third of the survey area was provided by soil scientists employed by Soil Conservation Service, and the fieldwork in the southern two-thirds of the area was provided by soil scientists employed by Soil and Land Use Technology, Inc., which was under contract to the Bureau of Land Management. The soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unmodified parent material in which the soil formed. The unmodified material is devoid of roots and most other living organisms and has not been changed by other biologic activity.

The soils and miscellaneous areas in the survey area are in orderly patterns that are related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil or miscellaneous area is associated with a particular kind or segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Individual soils on the landscape commonly merge gradually into one another as their characteristics gradually change. To construct an accurate map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size, and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes. Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While the soil survey was in progress, samples of some of the soils in the area were collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses and under different levels of management. Some interpretations were modified to fit local conditions, and some new interpretations were developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of

management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Landscapes

In this soil survey the mapped areas generally represent associations of two or three soil components as well as other included soils of small extent. Soil patterns commonly coincide with landforms and physiographic positions. In the section "Detailed Soil Map Units," descriptive terms are used to identify where the individual soil components occur on the landscape. While there is a relationship between landforms and soils, these are not mutually exclusive. Individual soil series commonly occur on more than one component landform.

In this survey area the landforms are classified and defined according to Peterson *(14)*. The landform elements are described and defined in a manner precise enough for one to visualize where soils occur in relation to each other. The intent of this section is not to define all of the landform terms but to briefly define the main

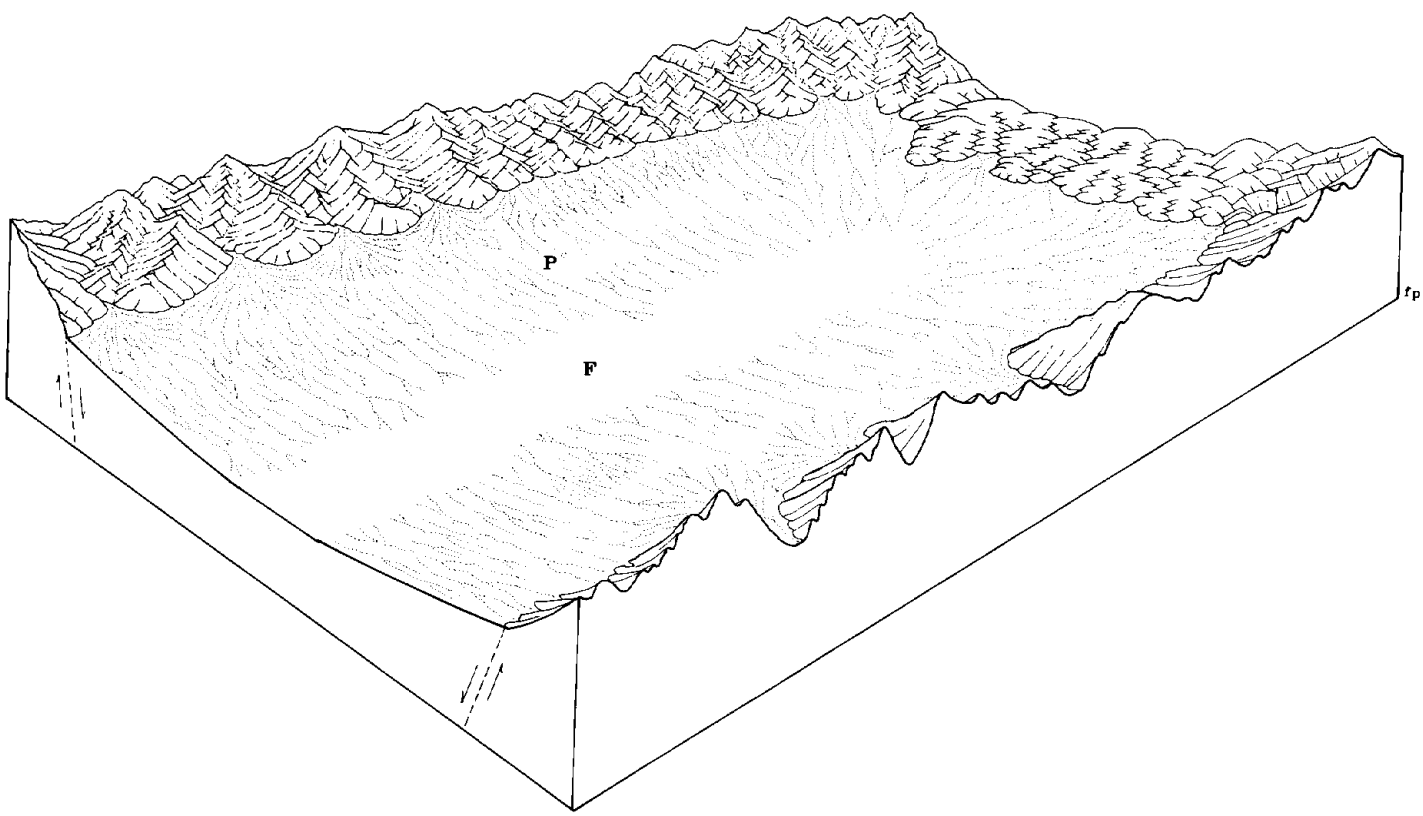


Figure 1.—The major physiographic parts of an internally drained intermontane basin, or bolson: The piedmont slope (P), and the basin floor, or more specifically, the bolson floor (F). This drawing shows part of an elongated bolson that has bounding mountain ranges on the near and far sides and is cut off by hills on the far end. The drainageways, shown by a dotted line, suggest positions of major landforms. Neither the playa nor the drainageways on the floor are shown.

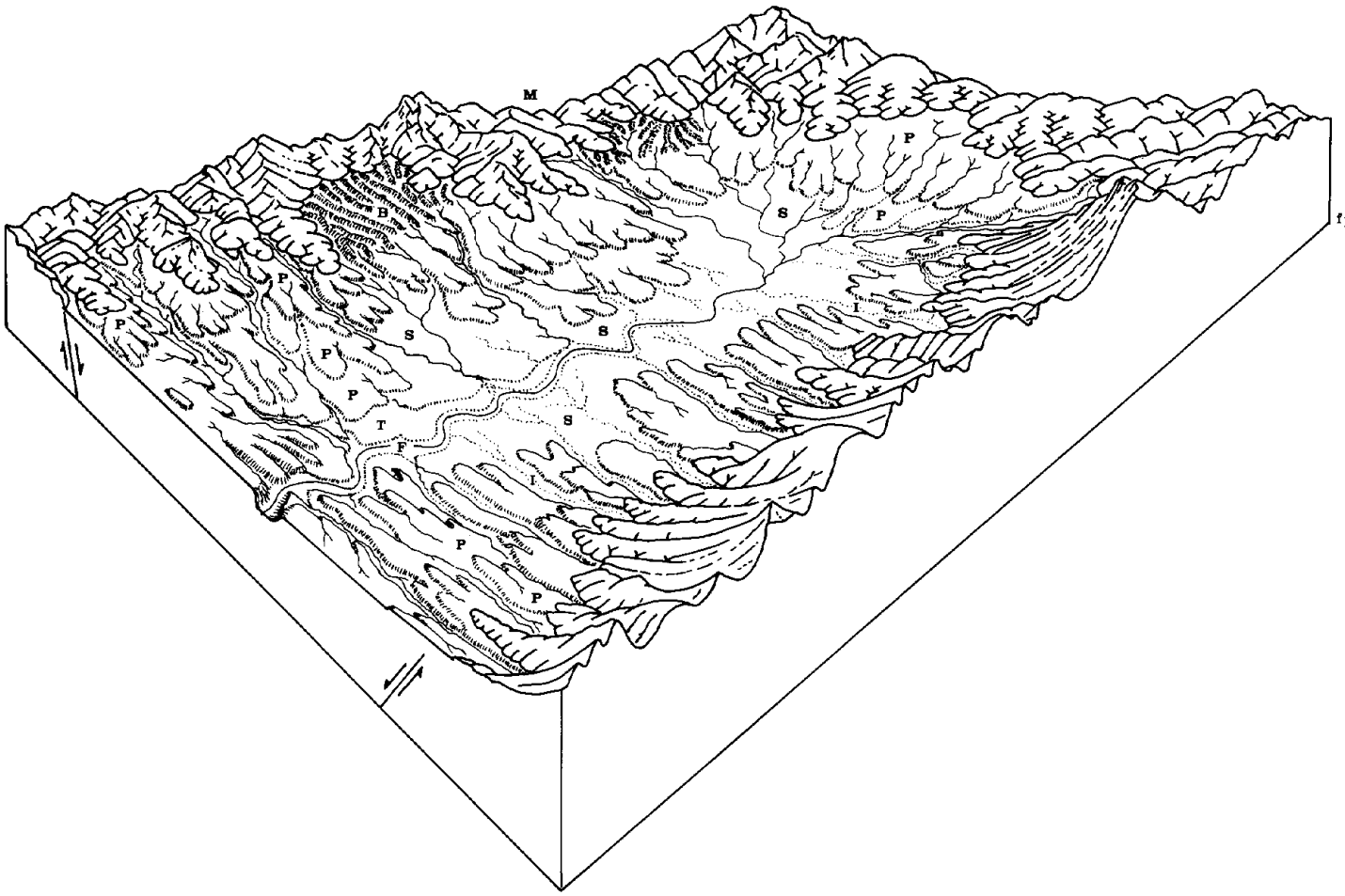


Figure 2.—A semibolson that displays the effects of several cycles of dissection and deposition. The major landforms are: Ballenas (B), fan piedmonts—comprising several levels, or ages, of fan remnants—(P), fan skirts (S), an axial stream terrace (T), and an axial stream flood plain (F). Alluvial fans are not distinguished from fan piedmonts. Component landforms of inset fans (I) are between fan remnants. The basin is bounded on two sides by mountains (M).

geomorphic surfaces in the survey area. All landform terms are defined in the glossary.

The landforms of the intermontane basins are first grouped in two general classes—bolson (fig. 1) and semibolson (fig. 2). Within these two groups are three major physiographic parts identified in the Basin and Range province (fig. 3). These are the bounding mountains, the piedmont slope, and the basin floor. The bounding mountains are not well defined; the slope components are identified and the hills are separated from the mountains by defining the former as a highland mass that rises less than 1,000 feet above the surrounding boundaries. The piedmont slope and basin floor are gross topographic forms that slope from the bounding mountains down to a central playa.

The shapes, genetic relationships, and geographic scales of the topography seen in the field are used to classify the landforms. The two general classes—bolson and semibolson—are successively divided into smaller and genetically more homogeneous classes (see Appendix). The broadest class consists of major physiographic parts, each of which is made up of several genetically related major landforms. They in turn may be comprised of several more genetically related component landforms. The component landforms are about the smallest single units that one would consider in combined terms of their form, constituent materials, and genetic history. Some component landforms, such as fan piedmont remnants, have distinctive topographic parts with quite different geomorphic histories. The fourth

class, landform elements, recognizes these parts. The fifth class, slope components, provides for those landform elements that are erosional surfaces to be subdivided into their genetic components.

For soil survey applications, it would be most convenient if somewhere in the hierarchy the landform classes corresponded to individual soils. The very purposes of a landform classification, however, prevent such classes from being gathered into a single category.

In the section "General Soil Map Units," a landscape position is given for each major component. These generally are major physiographic parts, major landforms, or component landforms. In the section "Detailed Soil Map Units," a broad landscape position is given for each map unit in the map unit setting. These are major physiographic parts or major landforms. A more detailed landscape position is also given for each major component and contrasting inclusion. These generally are component landforms, landform elements, or slope components.

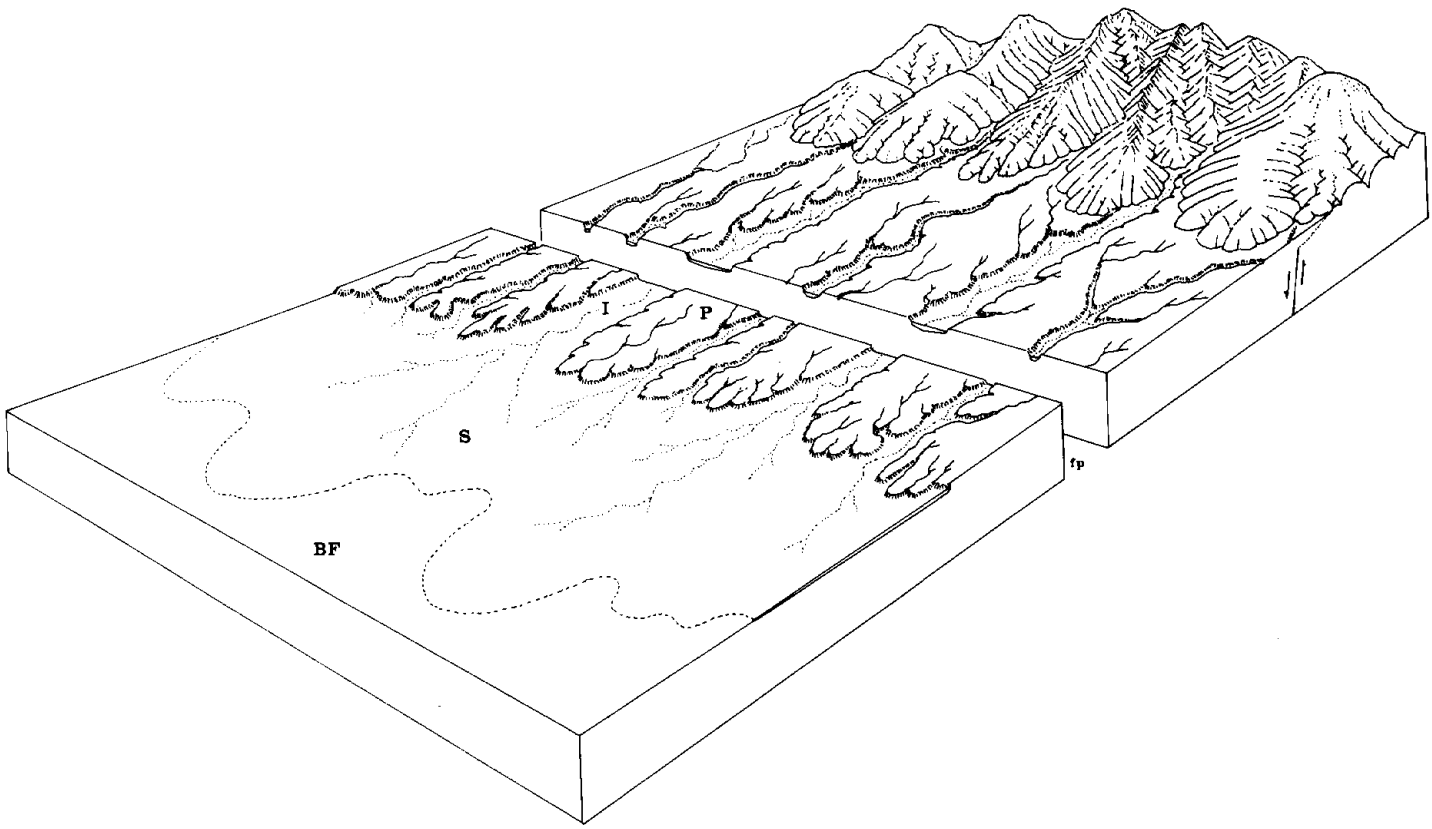


Figure 3.—A fan skirt (S) that merges along its lower boundary with a basin floor (BF) and that was formed by coalescing alluvial fans originating at gullies cut in a dissected fan piedmont (P) and by debouching inset fans (I) of the fan piedmont. The erosional fan piedmont remnants and mouths of the inset fans form the upper boundary of the fan skirt. It is the same age surface as the inset fans, but is younger than the relict summits of the fan remnants. It may be the same age or younger than the basin floor surface, but as shown here it is younger because its alluvium overlaps the basin floor surface.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The soils or miscellaneous areas making up one unit can occur in other units but in a different pattern.

A perspective of how the general soil map units relate to the various broad landscapes is illustrated in figures 4 and 5. The map units in figure 4 are representative of those on a bolson that is an internally drained intermontane basin. The associated landscapes for the dominant component soils in unit 1 are alluvial flats and alluvial flat remnants; unit 5, the upper and lower parts of fan piedmonts, fan aprons, and fan skirts; unit 15, the summits and side slopes of fan piedmont remnants; and unit 17, the crests and side slopes of mountains.

The map units in figure 5 are representative of those on a semibolson that is an externally drained intermontane basin. The soil-landscape relationships identified in unit 2 are dominantly flood plains and inset fans; unit 6, fan skirts and fan piedmonts; unit 9, fan piedmonts and inset fans; unit 10, fan piedmonts; unit 11, ballenas, fan piedmonts, and fan skirts; units 16 and 19, crests and side slopes of mountains; and unit 18, side slopes of mountains. The respective map unit

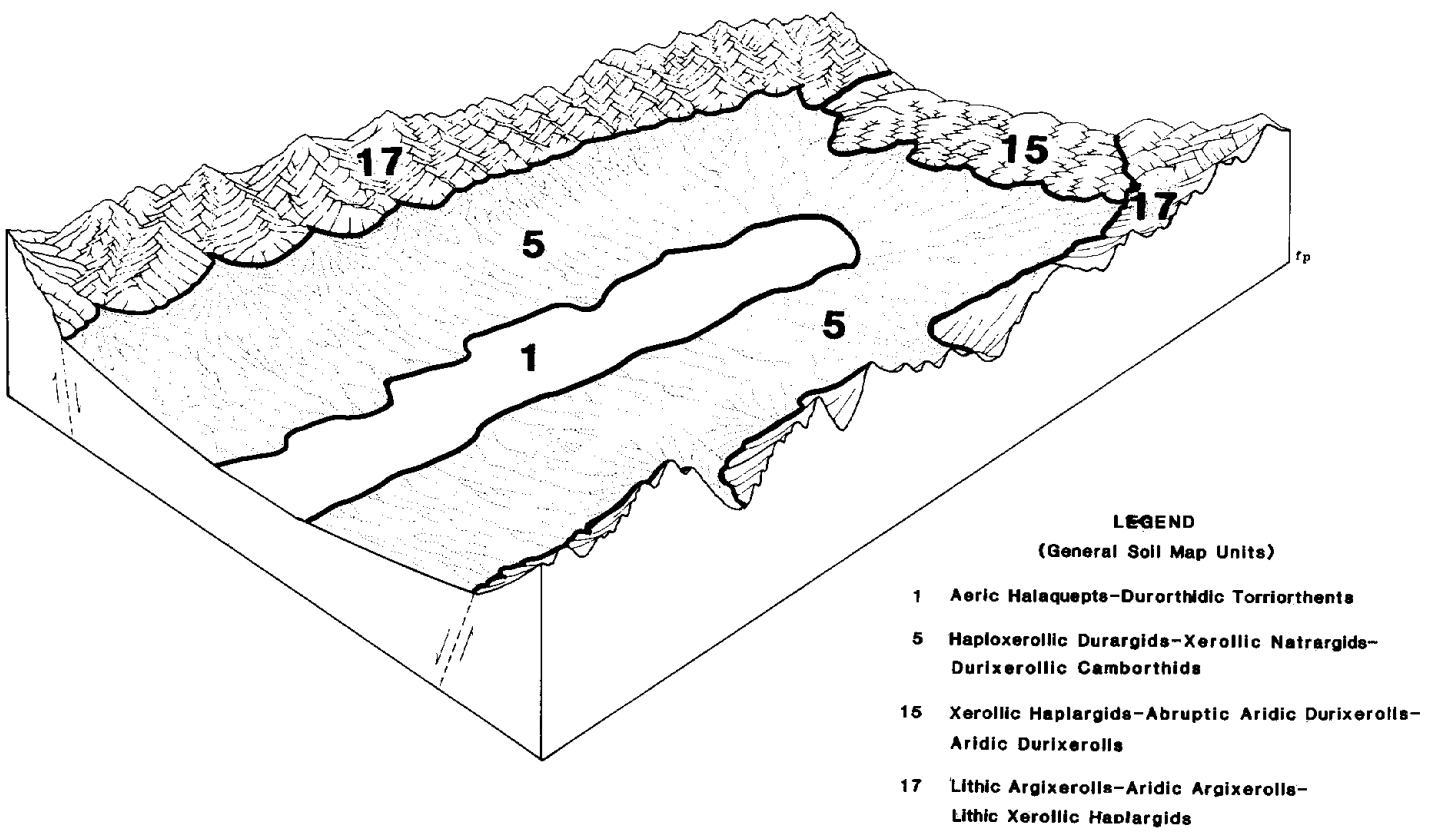


Figure 4.—General soil map units representative of those on a bolson that is an internally drained intermontane basin.

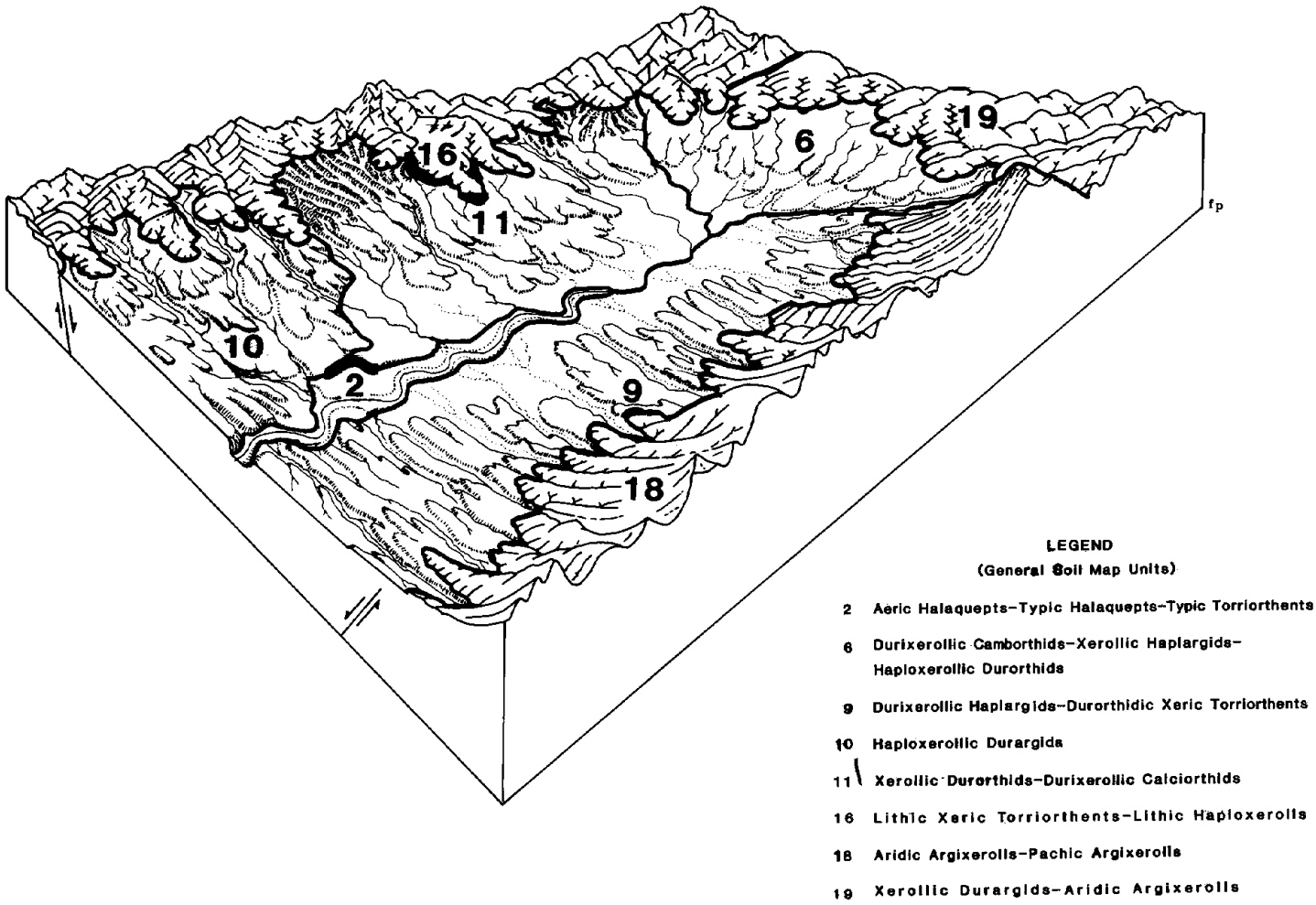


Figure 5.—General soil map units representative of those on a semibolson that is an externally drained intermontane basin.

descriptions give the landscape positions for each of the dominant soils.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils or miscellaneous areas can be identified on the map. Likewise, areas that are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The general map units in this survey have been grouped into general kinds of landscape for broad interpretive purposes. Each of the broad groups and the map units in each group are described in the following pages.

Map Unit Descriptions

Areas dominated by soils on basin and semibolson floors

This group consists of two map units. It makes up about 9 percent of the survey area.

1. Aeric Halaquepts-Durorthidic Torriorthents

Level and nearly level, very deep, somewhat poorly drained and moderately well drained soils; on alluvial flats and alluvial flat remnants

This map unit is in the lower parts of Crescent, Pine, and Grass Valleys. The vegetation is mainly alkali sacaton, basin wildrye, and inland saltgrass on the Aeric Halaquepts and black greasewood, bud sagebrush, and bottlebrush squirreltail on the Durorthidic Torriorthents.

This unit makes up about 5 percent of the survey area.

The fine-silty Aeric Halaquepts are somewhat poorly drained soils on alluvial flats. These soils are dominantly medium textured to moderately fine textured throughout the profile. They are strongly saline and alkali affected. These soils are subject to occasional to frequent periods of flooding.

The fine-silty Durorthidic Torriorthents are moderately well drained soils on alluvial flat remnants. These soils are dominantly medium textured throughout the profile. They are moderately saline and slightly alkali affected. These soils are not subject to flooding.

Of minor extent in this unit are fine Fluvaquentic Haplaquolls that are drained and Playas. The fine Fluvaquentic Haplaquolls are on flood plains and support basin wildrye, creeping wildrye, and bluegrass. The Playas are on the lower part of basin floors and are essentially devoid of vegetation.

This unit is used for livestock grazing and rangeland wildlife habitat. The Aeric Halaquepts are limited for these uses mainly by their strongly saline and alkali affected profile, a seasonal high water table, and the low average annual precipitation. The Durorthidic Torriorthents are limited mainly by their moderately saline and slightly alkali affected profile and the low average annual precipitation.

2. Aeric Halaquepts-Typic Halaquepts-Typic Torriorthents

Level and nearly level, very deep, somewhat poorly drained, very poorly drained, and well drained soils; on flood plains, lake plains, alluvial flat remnants, and inset fans

This map unit is in the lower parts of Antelope and Fish Creek Valleys and on Bean Flat. The vegetation is mainly alkali sacaton, basin wildrye, and inland saltgrass on the Aeric Halaquepts; alkali sacaton, alkali cordgrass, alkali muhly, and sedge on the Typic Halaquepts; and winterfat, shadscale, and bud sagebrush on the Typic Torriorthents.

This unit makes up about 4 percent of the survey area.

The fine-loamy Aeric Halaquepts are somewhat poorly drained soils on flood plains. These soils are dominantly medium textured to moderately fine textured throughout the profile. They are slightly saline and strongly alkali affected. These soils are subject to occasional periods of flooding.

The fine-silty Typic Halaquepts are very poorly drained soils on lake plains. These soils are dominantly medium textured to moderately fine textured throughout the profile. They are dominantly slightly saline and strongly alkali affected. Most areas of these soils are subject to occasional periods of flooding. In Fish Creek Valley these soils are on alluvial flat remnants and are drained as a result of channel entrenchment. The soils in this area are strongly saline and alkali affected. They are not subject to flooding.

The fine-silty Typic Torriorthents are well drained soils on inset fans. These soils are dominantly medium textured to moderately fine textured throughout the profile. They are slightly to moderately saline affected in the lower part of the profile. These soils are not subject to flooding.

Of minor extent in this unit are fine Fluvaquentic Haplaquolls, coarse-loamy Aeric Halaquepts, and Playas. The fine Fluvaquentic Haplaquolls are on flood plains and support rush, sedge, alkali sacaton, and inland saltgrass. The coarse-loamy Aeric Halaquepts support vegetation similar to that on the fine-loamy Aeric Halaquepts. The Playas are on the lower part of basin floors and are essentially devoid of vegetation.

This unit is used for livestock grazing, irrigated pasture, and rangeland wildlife habitat.

Most areas of the Typic Halaquepts and Aeric Halaquepts are limited for livestock grazing and rangeland wildlife habitat mainly by the slightly saline and strongly alkali affected profile, a seasonal high water table, and the low average annual precipitation. In Fish Creek Valley, the main limitations for these soils are the strongly saline and alkali affected profile and the low average annual precipitation. The Typic Torriorthents are limited for livestock grazing and rangeland wildlife habitat by the low average annual precipitation.

Irrigated pasture is grown only on the drained Typic Halaquepts in Fish Creek Valley. The main limitation for this use is the strongly saline and alkali affected profile.

Areas dominated by soils on fan skirts, alluvial fans, fan aprons, and lower fan piedmonts

This group consists of eight map units. It makes up about 42 percent of the survey area.

3. Typic Camborthids-Duric Camborthids

Level and nearly level, very deep, somewhat excessively drained and well drained soils; on fan skirts

This map unit is in the extreme southeastern part of the survey area, in Little Smoky Valley. The vegetation is mainly Indian ricegrass, needleandthread, and winterfat on the Typic Camborthids and shadscale, bud sagebrush, and bottlebrush squirreltail on the Duric Camborthids.

This unit makes up about 2 percent of the survey area.

The sandy-skeletal Typic Camborthids are somewhat excessively drained soils on fan skirts. These soils are coarse textured in the upper part and are very gravelly and very coarse textured in the lower part. They are slightly saline affected in the lower part of the profile.

The coarse-loamy Duric Camborthids are well drained soils on fan skirts. These soils are moderately coarse textured throughout the profile. They are slightly or moderately saline affected in the lower part of the profile.

Of minor extent in this unit are shallow Durorthids and coarse-silty Typic Camborthids. The shallow Durorthids are on fan piedmonts and support black sagebrush and Indian ricegrass. The coarse-silty Typic Camborthids are on inset fans and support winterfat, bud sagebrush, and bottlebrush squirreltail.

This unit is used for livestock grazing and rangeland wildlife habitat.

4. Typic Nadurargids-Typic Camborthids-Duric Camborthids

Level to moderately sloping, shallow and very deep, well drained soils; on fan piedmont remnants, alluvial fans, and fan skirts

This map unit is in the northwestern part of the survey area, in Crescent Valley. The vegetation is mainly shadscale, bud sagebrush, and bottlebrush squirreltail.

This unit makes up about 2 percent of the survey area.

The shallow, loamy Typic Nadurargids are in nearly level and gently sloping areas on fan piedmont remnants. These soils are gravelly and coarse textured in the upper part and are moderately fine textured over a hardpan in the lower part. They are strongly alkali affected.

The very deep, loamy-skeletal Typic Camborthids are in gently sloping to moderately sloping areas on alluvial fans and fan skirts. These soils are gravelly and moderately coarse textured in the upper part and are very gravelly and extremely gravelly and coarse textured in the lower part. They are slightly or moderately saline affected in the lower part of the profile.

The very deep, coarse-silty Duric Camborthids are in level and nearly level areas on fan skirts. These soils are moderately coarse textured to medium textured throughout the profile. They are slightly or moderately saline affected in the lower part of the profile.

Of minor extent in this unit are very deep, fine-loamy Duric Natrargids; moderately deep, fine-loamy Haploxerollic Durargids; and very deep, fine Xerollic Natrargids. The Duric Natrargids are on the lower part of fan piedmonts and support vegetation similar to that of the major soils in this unit. The Haploxerollic Durargids and Xerollic Natrargids are on the upper part of fan piedmonts and support Wyoming big sagebrush, bluebunch wheatgrass, Thurber needlegrass, and bottlebrush squirreltail.

This unit is used mainly for livestock grazing and rangeland wildlife habitat. Some areas are used for homesite development.

The main limitations for livestock grazing and rangeland wildlife habitat on the Typic Nadurargids are the shallow depth to a hardpan, the strongly alkali middle part of the profile, and the low average annual precipitation. The main limitation on the Typic Camborthids and Duric Camborthids is the low average annual precipitation.

This unit is moderately suited to homesite development. The main limitation is the shallow depth to a hardpan in the Typic Nadurargids.

5. Haploxerollic Durargids-Xerollic Natrargids-Durixerollic Camborthids

Gently sloping to moderately sloping, moderately deep and very deep, well drained soils; on fan piedmonts, fan aprons, and fan skirts

This map unit borders the mountains in Crescent and Grass Valleys. The vegetation is mainly Wyoming big sagebrush, Thurber needlegrass, bluebunch wheatgrass, and bottlebrush squirreltail.

This unit makes up about 4 percent of the survey area.

The fine-loamy Haploxerollic Durargids are moderately deep soils in gently sloping to moderately sloping areas on fan piedmonts. These soils are medium textured in the upper part and are medium textured to moderately fine textured over a strongly cemented hardpan in the lower part.

The fine Xerollic Natrargids are very deep soils in gently sloping to moderately sloping areas on fan piedmonts. These soils are medium textured in the upper part, fine textured in the middle part, and very gravelly and moderately coarse textured in the lower part. They are slightly saline and alkali affected in the middle part.

The loamy-skeletal Durixerollic Camborthids are very deep soils in gently sloping to moderately sloping areas on fan aprons and fan skirts. They are gravelly and medium textured in the upper part and are very gravelly and extremely cobbly and coarse textured and very coarse textured in the lower part.

Of minor extent in this unit are loamy-skeletal Typic Camborthids, coarse-silty Durorthidic Xeric Torriorthents, and coarse-loamy Durorthidic Torriorthents. The loamy-skeletal Typic Camborthids are on alluvial fans and support shadscale and bud sagebrush. The coarse-silty Durorthidic Xeric Torriorthents are on fan skirts and support vegetation similar to that on the major soils in this unit. The coarse-loamy Durorthidic Torriorthents are on fan skirts and support shadscale and bud sagebrush.

This unit is used for livestock grazing and rangeland wildlife habitat. The main limitation for these uses is the moderately low average annual precipitation.

6. Durixerollic Camborthids-Xerollic Haplargids-Haploxerollic Durorthids

Level to moderately sloping, very deep and moderately deep, well drained soils; on fan skirts and fan piedmonts

This map unit is in the south-central part of the survey area, in Kobeh and Antelope Valleys. The vegetation is mainly Wyoming big sagebrush, Thurber needlegrass, bluebunch wheatgrass, and bottlebrush squirreltail.

This unit makes up about 17 percent of the survey area.

The coarse-loamy Durixerollic Camborthids are very deep soils in gently sloping to moderately sloping areas on fan skirts. These soils are coarse textured in the upper part and are very gravelly and very coarse textured in the lower part.

The fine-loamy Xerollic Haplargids are very deep soils in level to gently sloping areas on fan piedmonts. These soils are medium textured in the upper part, moderately fine textured in the middle part, and stratified, gravelly and coarse textured in the lower part.

The fine-loamy Haploxerollic Durorthids are moderately deep soils in level to moderately sloping areas on fan piedmonts on the east side of Kobeh Valley and the south side of Bean Flat. These soils are dominantly medium textured over a strongly cemented hardpan.

Of minor extent in this unit are coarse-loamy Xeric Torriorthents, fine-loamy Aeric Halaquepts, loamy-skeletal Typic Camborthids, and fine-loamy Duric Natrargids. The coarse-loamy Xeric Torriorthents are on inset fans and support winterfat, Indian ricegrass, and bud sagebrush. The fine-loamy Aeric Halaquepts are on alluvial flats and support alkali sacaton, basin wildrye, and black greasewood. The loamy-skeletal Typic Camborthids are on fan skirts and the fine-loamy Duric Natrargids are on fan piedmonts; these soils support shadscale and bud sagebrush.

This unit is used for livestock grazing and rangeland wildlife habitat. The main limitation for these uses is the moderately low average annual precipitation.

7. Entic Durorthids

Level to gently sloping, shallow, well drained soils; on fan piedmonts

This map unit is in Antelope Valley. The vegetation is mainly shadscale, bud sagebrush, and bottlebrush squirreltail.

This unit makes up about 3 percent of the survey area.

The shallow, loamy Entic Durorthids are on fan piedmonts. These soils are dominantly moderately coarse textured over a strongly cemented hardpan.

Of minor extent in this unit are shallow, loamy-skeletal Haploxerollic Durorthids and loamy-skeletal Durixerollic Camborthids. The shallow, loamy-skeletal Haploxerollic Durorthids are on fan piedmonts and support black sagebrush and Indian ricegrass. The loamy-skeletal Durixerollic Camborthids are on inset fans and support Wyoming big sagebrush, Thurber needlegrass, and bluebunch wheatgrass.

This unit is used for livestock grazing and rangeland wildlife habitat.

8. Xerollic Paleorthids-Aridic Petrocalcic Palexerolls

Gently sloping to moderately sloping, moderately deep, well drained soils; on fan piedmonts

This map unit is in the enclosed mountain valley directly west of Eureka and east of the Mahogany Hills. The vegetation is mainly black sagebrush, Indian ricegrass, and needleandthread on the Xerollic Paleorthids and big sagebrush, bluebunch wheatgrass, and Thurber needlegrass on the Aridic Petrocalcic Palexerolls.

This unit makes up about 1 percent of the survey area.

The loamy-skeletal Xerollic Paleorthids are in gently sloping to moderately sloping areas on fan piedmonts. The upper part of these soils is moderately coarse textured, and the lower part is very gravelly and moderately coarse textured and is underlain by a hardpan.

The loamy-skeletal Aridic Petrocalcic Palexerolls are in gently sloping to moderately sloping areas on fan piedmonts. The upper part of these soils is gravelly, moderately coarse textured, and dark colored, and the lower part is very gravelly and medium textured and is underlain by a hardpan.

Of minor extent in this unit are fine-silty Xerollic Camborthids, fine-loamy Aridic Calcic Argixerolls, and fine Aquic Chromoxererts. The fine-silty Xerollic Camborthids are on inset fans and support basin big sagebrush, basin wildrye, and bluebunch wheatgrass. The fine-loamy Aridic Calcic Argixerolls are on lower adjacent mountain side slopes and support big sagebrush, Idaho fescue, and bluebunch wheatgrass. The fine Aquic Chromoxererts are on lake plains, have a perched water table, and support silver sagebrush and mat muhly.

This unit is used mainly for livestock grazing and rangeland wildlife habitat. The main limitation for these uses is the low available water capacity of the soils.

9. Durixerollic Haplargids-Durorthidic Xeric Torriorthents

Gently sloping to strongly sloping, very deep, well drained soils; on fan piedmonts and inset fans

This map unit is in the northern part of the survey area, in Pine and Garden Valleys. The vegetation is mainly Wyoming big sagebrush, Thurber needlegrass, bluebunch wheatgrass, and bottlebrush squirreltail.

This unit makes up about 10 percent of the survey area.

Loamy-skeletal Durixerollic Haplargids are in moderately sloping to strongly sloping areas on fan piedmonts. The upper part of these soils is gravelly and moderately coarse textured, the middle part is very gravelly and moderately fine textured, and the lower part is very gravelly and coarse textured.

Coarse-silty Durorthidic Xeric Torriorthents are in gently sloping areas on inset fans. These soils are dominantly moderately coarse textured throughout the profile.

Fine-loamy Durixerollic Haplargids are in gently sloping to moderately sloping areas on fan piedmonts. The upper part of these soils is gravelly and coarse textured,

the middle part is gravelly and medium textured, and the lower part is gravelly and very gravelly and is coarse textured.

Of minor extent in this unit are coarse-loamy Xeric Torriorthents, coarse-loamy Durixerollic Camborthids, and fine-loamy Cumulic Haplaquolls. The coarse-loamy Xeric Torriorthents are on dissected fan piedmont side slopes and support black sagebrush and Indian ricegrass. The coarse-loamy Durixerollic Camborthids are on inset fans and support Wyoming big sagebrush, Thurber needlegrass, and bottlebrush squirreltail. The fine-loamy Cumulic Haplaquolls are on flood plains and support basin big sagebrush, basin wildrye, and Nevada bluegrass.

This unit is used mainly for livestock grazing and rangeland wildlife habitat. The main limitation for these uses is the moderately low average annual precipitation.

10. Haploxerollic Durargids

Gently sloping to moderately sloping, moderately deep, well drained soils; on fan piedmont remnants

This map unit is in the central part of the survey area, in Kobeh Valley. The vegetation is mainly Wyoming big sagebrush, Thurber needlegrass, and bluebunch wheatgrass.

This unit makes up about 3 percent of the survey area.

The fine Haploxerollic Durargids are on fan piedmont remnants. The upper part of these soils is medium textured, and the lower part is fine textured and is underlain by a strongly cemented hardpan.

Of minor extent in this unit are shallow, loamy Xerollic Durorthids, loamy-skeletal Xerollic Camborthids, coarse-loamy Durixerollic Camborthids, and fine-loamy Cumulic Haplaquolls. The shallow, loamy Xerollic Durorthids are on fan piedmonts and support black sagebrush and Indian ricegrass. Some areas of the loamy-skeletal Xerollic Camborthids are on fan piedmonts and support black sagebrush and Indian ricegrass. Some areas of the loamy-skeletal Xerollic Camborthids are on fan skirts and the coarse-loamy Durixerollic Camborthids are on inset fans; these soils support Wyoming big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail, and Thurber needlegrass. The fine-loamy Cumulic Haplaquolls are on flood plains and support basin big sagebrush, basin wildrye, and Nevada bluegrass.

This unit is used mainly for livestock grazing and rangeland wildlife habitat.

Areas dominated by soils on fan piedmonts, low hills, ballenas, alluvial fans, and fan skirts

This group consists of five map units. It makes up about 17 percent of the survey area.

11. Xerollic Durorthids-Durixerollic Calciorthids

Gently sloping to strongly sloping, shallow and very deep, well drained and somewhat excessively drained soils; on fan piedmonts, ballenas, alluvial fans, and fan skirts

This unit is in the east-central and southern parts of the survey area. The vegetation is mainly singleleaf pinyon, Utah juniper, and black sagebrush on the shallow, loamy-skeletal Xerollic Durorthids, black sagebrush and Indian ricegrass on the shallow, loamy Xerollic Durorthids, and big sagebrush and Indian ricegrass on the loamy-skeletal Durixerollic Calciorthids.

This unit makes up about 9 percent of the survey area.

The shallow, loamy-skeletal Xerollic Durorthids are well drained soils in moderately sloping to strongly sloping areas on ballenas. These soils are very gravelly and medium textured to very gravelly and moderately coarse textured over a hardpan.

The shallow, loamy Xerollic Durorthids are well drained soils in gently sloping to moderately sloping areas on fan piedmonts. These soils are dominantly medium textured over a hardpan.

The very deep, loamy-skeletal Durixerollic Calciorthids are somewhat excessively drained soils in moderately sloping areas on alluvial fans and fan skirts. These soils are gravelly and moderately coarse textured in the upper part and are very gravelly and medium textured and extremely gravelly and coarse textured in the lower part.

Of minor extent in this unit are fine Aridic Durixerolls, coarse-loamy Xeric Torriorthents, and loamy-skeletal Typic Camborthids. The fine Aridic Durixerolls are on fan piedmonts and support singleleaf pinyon, Utah juniper, and big sagebrush. The coarse-loamy Xeric Torriorthents are on inset fans and support Wyoming big sagebrush, bluebunch wheatgrass, and bottlebrush squirreltail. The loamy-skeletal Typic Camborthids are on fan skirts and support winterfat, bud sagebrush, and Indian ricegrass.

This unit is used for livestock grazing, woodland, and rangeland wildlife habitat. The main limitation of the Xerollic Durorthids is the very low available water capacity.

12. Lithic Xerollic Haplargids-Duric Camborthids-Haploxerollic Durargids

Gently sloping to moderately sloping and moderately steep to steep, shallow, moderately deep, and very deep, well drained soils; on hillsides, fan aprons, fan skirts, and fan piedmonts

This map unit is in the extreme northwestern part of the survey area, in the Dry Hills, which are east of Crescent Valley. The vegetation is mainly Wyoming big sagebrush, Thurber needlegrass, bluebunch wheatgrass, and bottlebrush squirreltail on the loamy-skeletal Lithic Xerollic Haplargids and the fine-loamy Haploxerollic Durargids, and it is mainly shadscale, bud sagebrush, and bottlebrush squirreltail on the coarse-loamy Duric Camborthids.

This unit makes up about 1 percent of the survey area.

The loamy-skeletal Lithic Xerollic Haplargids are shallow soils in moderately steep to steep areas on hillsides. The upper part of these soils is very gravelly and moderately coarse textured, and the lower part is very gravelly and moderately fine textured over bedrock.

The coarse-loamy Duric Camborthids are very deep soils in gently sloping to moderately sloping areas on fan skirts and fan aprons. These soils are dominantly moderately coarse textured throughout the profile. They are slightly to moderately saline and alkali affected in the lower part of the profile.

The fine-loamy Haploxerollic Durargids are moderately deep soils in gently sloping to moderately sloping areas on fan piedmonts. The upper part of these soils is medium textured, and the lower part is medium textured to moderately fine textured over a strongly cemented hardpan.

Of minor extent in this unit are fine Xerollic Haplargids; fine Xerollic Natrargids; shallow, loamy Typic Durorthids; and fine-loamy Duric Natrargids. The fine Xerollic Haplargids and Xerollic Natrargids are on side slopes of mountains and fan piedmonts, respectively; these soils support vegetation similar to that on the Lithic Xerollic Haplargids and Haploxerollic Durargids in this unit. The loamy, shallow Typic Durorthids and the fine-loamy Duric Natrargids are on side slopes of mountains and fan piedmonts, respectively; they support vegetation similar to that on the Duric Camborthids in this unit.

This unit is used for livestock grazing and rangeland wildlife habitat. The main limitations of the Lithic Xerollic Haplargids for these uses are steepness of slope and shallow depth to rock. The main limitation of the Duric Camborthids and Haploxerollic Durargids is the moderately low average annual precipitation.

13. Xeric Torriorthents-Durorthidic Xeric Torriorthents

Gently sloping to steep, shallow, moderately deep, and very deep, well drained soils; on low hills and inset fans

This map unit is in areas surrounding Pine Valley. The vegetation is mainly Utah juniper and big sagebrush on the Xeric Torriorthents and Wyoming big sagebrush, Thurber needlegrass, bluebunch wheatgrass, and bottlebrush squirreltail on the Durorthidic Xeric Torriorthents.

This unit makes up about 4 percent of the survey area.

Coarse-loamy Xeric Torriorthents are moderately deep soils in moderately sloping to steep areas on low hills. These soils are dominantly moderately coarse textured over hard bedrock.

Loamy Xeric Torriorthents are shallow soils in moderately steep to steep, areas on low hills. These soils are dominantly moderately coarse textured over soft bedrock.

Coarse-silty Durorthidic Xeric Torriorthents are very deep soils in gently sloping to moderately sloping areas on inset fans. These soils are dominantly medium textured throughout the profile.

Of minor extent in this unit are coarse-loamy Durixerollic Camborthids and fine-loamy Aridic Argixerolls. The coarse-loamy Durixerollic Camborthids are on inset fans, and the fine-loamy Aridic Argixerolls are on low hills. These soils support Wyoming big sagebrush, Thurber needlegrass, bottlebrush squirreltail, and bluebunch wheatgrass.

This unit is used for livestock grazing, woodland, and rangeland wildlife habitat. The coarse-silty Durorthidic Xeric Torriorthents are suited to these uses. The main limitations of the coarse-loamy Xeric Torriorthents are the moderate available water capacity and steepness of slope. The main limitations of the loamy Xeric Torriorthents are the shallow depth to bedrock, low available water capacity, and steepness of slope.

14. Xerollic Natrargids

Gently sloping to moderately sloping, very deep, well drained soils; on fan piedmont remnants

This map unit is in the northern part of the survey area. It borders the southeastern side of the Cortez Mountains. The vegetation is mainly Wyoming big sagebrush, Thurber needlegrass, bluebunch wheatgrass, and bottlebrush squirreltail.

This unit makes up about 2 percent of the survey area.

The fine Xerollic Natrargids are on fan piedmont remnants. The upper part of these soils is medium textured, the middle part is fine textured, and the lower part is very cobbly and is coarse textured and moderately coarse textured. These soils are slightly saline and alkali affected in the lower part of the fine textured layer.

Of minor extent in this unit are loamy-skeletal Durixerollic Haplargids, fine Haploxerollic Durargids, and coarse-silty Durorthidic Xeric Torriorthents. The loamy-skeletal Durixerollic Haplargids are on slightly dissected side slopes of fan piedmonts. The fine Haploxerollic Durargids are on the upper parts of fan piedmonts. The coarse-silty Durorthidic Xeric Torriorthents are on inset fans. All of these soils support vegetation similar to that on the major soils in this unit.

This unit is used for livestock grazing and rangeland wildlife habitat. The main limitation for these uses is the moderately low average annual precipitation.

15. Xerollic Haplargids-Abruptic Aridic Durixerolls-Aridic Durixerolls

Gently sloping to very steep, moderately deep and deep, well drained soils; on fan piedmont remnants

This map unit is in the northeastern part of the survey area, between the Cortez Mountains and Pine Valley. The vegetation is mainly big sagebrush, bluebunch wheatgrass, and Idaho fescue on the Xerollic Haplargids;

low sagebrush, Thurber needlegrass, and Sandberg bluegrass on the Abruptic Aridic Durixerolls; and big sagebrush, Thurber needlegrass, and bluebunch wheatgrass on the Aridic Durixerolls.

This unit makes up about 1 percent of the survey area.

The clayey-skeletal Xerollic Haplargids are deep soils in steep to very steep areas on side slopes of fan piedmont remnants. The upper part of these soils is gravelly and moderately fine textured, the middle part is fine textured, and the lower part is extremely gravelly and moderately fine textured.

The very fine Abruptic Aridic Durixerolls are moderately deep soils in gently sloping to moderately sloping areas on summits of fan piedmont remnants. The upper part of these soils is gravelly and medium textured, and the lower part is very fine textured and is underlain by a hardpan.

The fine Aridic Durixerolls are moderately deep soils in moderately sloping to strongly sloping areas on summits and upper side slopes of fan piedmont remnants. The upper part of these soils is gravelly and medium textured, and the lower part is fine textured and is underlain by a hardpan.

Of minor extent in this unit are coarse-loamy Durixerollic Camborthids, clayey-skeletal Xerollic Haplargids, and fine-loamy Aridic Argixerolls. The coarse-loamy Durixerollic Camborthids are on inset fans and support big sagebrush, Thurber needlegrass, and bluebunch wheatgrass. The clayey-skeletal Xerollic Haplargids are on summits of fan piedmont remnants and support bluebunch wheatgrass, Thurber needlegrass, and basin wildrye. The fine-loamy Aridic Argixerolls are on side slopes of fan piedmont remnants and support big sagebrush, bluebunch wheatgrass, and Thurber needlegrass.

This unit is used for livestock grazing and rangeland wildlife habitat. The main limitation of the clayey-skeletal Xerollic Haplargids for these uses is the steepness of slope. The main limitation of the very fine Abruptic Aridic Durixerolls are shallow depth to the clayey layer and to the hardpan. The fine Aridic Durixerolls are suited to livestock grazing and rangeland wildlife habitat.

Areas dominated by soils on mountains

This group consists of four map units. It makes up about 32 percent of the survey area.

16. Lithic Xeric Torriorthents-Lithic Haploxerolls

Strongly sloping to very steep, very shallow and shallow, well drained and somewhat excessively drained soils; on crests and side slopes of mountains

This map unit is in mountain ranges throughout the survey area. The vegetation is mainly singleleaf pinyon, Utah juniper, and black sagebrush on the loamy-skeletal, carbonatic Lithic Xeric Torriorthents; black sagebrush and Indian ricegrass on the loamy-skeletal Lithic Xeric Torriorthents; and singleleaf pinyon, Utah juniper, and big sagebrush on the loamy-skeletal Lithic Haploxerolls.

This unit makes up about 16 percent of the survey area.

The loamy-skeletal, carbonatic Lithic Xeric Torriorthents are very shallow, well drained soils in strongly sloping to steep areas on side slopes of mountains. They are dominantly very gravelly and medium textured over hard bedrock.

The loamy-skeletal Lithic Xeric Torriorthents are shallow, somewhat excessively drained soils in strongly sloping to very steep areas on crests and side slopes of mountains. They are dominantly very gravelly and moderately coarse textured over hard bedrock.

The loamy-skeletal Lithic Haploxerolls are shallow, well drained soils in strongly sloping to very steep areas on side slopes of mountains. These soils are dominantly very cobbly and moderately coarse textured over hard bedrock.

Of minor extent in this unit are loamy-skeletal Aridic Calcixerolls, clayey-skeletal Typic Argixerolls, and Rock outcrop. The loamy-skeletal Aridic Calcixerolls and clayey-skeletal Typic Argixerolls are on side slopes of mountains and support singleleaf pinyon, Utah juniper, and big sagebrush. The Rock outcrop occurs randomly throughout the unit and is barren.

This unit is used for livestock grazing, woodland, and rangeland wildlife habitat. The main limitations for these uses are the steepness of slope in some areas, the shallow depth to bedrock, and very low available water capacity.

17. Lithic Argixerolls-Aridic Argixerolls-Lithic Xerollic Haplargids

Strongly sloping to very steep, shallow and moderately deep, well drained soils; on mountain crests and side slopes

This map unit is in the northern part of the survey area, in the Cortez Mountains. The vegetation is mainly low sagebrush, Idaho fescue, and bluegrass on the clayey-skeletal Lithic Argixerolls and loamy-skeletal Lithic Xerollic Haplargids, and it is mainly bluebunch wheatgrass, big sagebrush, and basin wildrye on the clayey-skeletal Aridic Argixerolls.

This unit makes up about 7 percent of the survey area.

The clayey-skeletal Lithic Argixerolls are shallow soils in moderately steep to steep areas on mountain crests and side slopes. The upper part of these soils is very gravelly and medium textured, and the lower part is very gravelly and fine textured and is underlain by hard bedrock.

The clayey-skeletal Aridic Argixerolls are moderately deep soils in strongly sloping to steep areas on side slopes of mountains. The upper part of these soils is very gravelly and medium textured, and the lower part is

very gravelly and fine textured and is underlain by hard bedrock.

The loamy-skeletal Lithic Xerollic Haplargids are shallow soils in moderately steep to very steep areas on mountain crests and side slopes. The upper part of these soils is very gravelly and medium textured, and the lower part is very gravelly and moderately fine textured and is underlain by hard bedrock.

Of minor extent in this unit are fine Aridic Calcic Argixerolls, loamy-skeletal Aridic Argixerolls, and fine-loamy Pachic Cryoborolls, all of which are on side slopes of mountains. The fine Aridic Calcic Argixerolls support big sagebrush, bluebunch wheatgrass, Thurber needlegrass, and Nevada bluegrass. The loamy-skeletal Aridic Argixerolls support bluebunch wheatgrass, basin wildrye, and big sagebrush. The fine-loamy Pachic Cryoborolls are in concave areas on north aspects and support big sagebrush, Idaho fescue, bluebunch wheatgrass, and basin wildrye.

This unit is used for livestock grazing and rangeland wildlife habitat. The main limitations of the clayey-skeletal Lithic Argixerolls and the loamy-skeletal Lithic Xerollic Haplargids for these uses are the shallow depth to bedrock, steepness of slope, and low available water capacity. The main limitation of the clayey-skeletal Aridic Argixerolls is the steepness of slope.

18. Aridic Argixerolls-Pachic Argixerolls

Strongly sloping to steep, deep and very deep, well drained soils; on side slopes of mountains

This map unit is in the central part of the survey area, in the Simpson Park Mountains. The vegetation is mainly singleleaf pinyon, Utah juniper, and big sagebrush on the fine Aridic Argixerolls; big sagebrush, bluebunch wheatgrass, and Idaho fescue on the loamy-skeletal Pachic Argixerolls; and big sagebrush, bluebunch wheatgrass, serviceberry, and basin wildrye on the fine Aridic Argixerolls.

This unit makes up about 6 percent of the survey area.

The fine Aridic Argixerolls are deep soils in moderately steep to steep areas on side slopes of mountains. The upper part of these soils is extremely stony and medium textured, and the lower part is fine textured.

The loamy-skeletal Pachic Argixerolls are very deep soils in strongly sloping to steep areas on side slopes of mountains. The upper part of these soils is stony and very stony, thick, dark colored, and medium textured; the middle part is very gravelly and moderately fine textured; and the lower part is very gravelly and medium textured.

The fine Aridic Argixerolls are deep soils in moderately steep to steep areas on side slopes of mountains. The upper part of these soils is cobbly and medium textured, and the lower part is fine textured.

Of minor extent in this unit are loamy-skeletal Lithic Haploxerolls and loamy-skeletal Lithic Argixerolls on mountain crests and upper side slopes. These soils support low sagebrush, black sagebrush, Idaho fescue, and Sandberg bluegrass.

This unit is used for livestock grazing, woodland, and rangeland wildlife habitat.

19. Xerollic Durargids-Aridic Argixerolls

Strongly sloping to steep, shallow and moderately deep, well drained soils; on mountain crests and side slopes

This map unit is in the central part of the survey area, in the Simpson Park Mountains. The vegetation is mainly black sagebrush, Indian ricegrass, and needleandthread on the shallow, clayey-skeletal Xerollic Durargids and the shallow, loamy-skeletal Xerollic Durargids, and it is mainly low sagebrush, pine bluegrass, and Thurber needlegrass on the fine Aridic Argixerolls.

This unit makes up about 3 percent of the survey area.

The shallow, clayey-skeletal Xerollic Durargids are in moderately steep areas on mountain crests and upper side slopes. The upper part of these soils is very stony and medium textured, and the lower part is very cobbly and fine textured and is underlain by a thin, hardpan over bedrock.

The fine Aridic Argixerolls are moderately deep soils in strongly sloping to moderately steep areas on mountain crests and side slopes. The upper part of these soils is extremely stony and medium textured, and the lower part is fine textured over bedrock.

The shallow, loamy-skeletal Xerollic Durargids are in moderately steep to steep areas on side slopes of mountains. The upper part of these soils is very stony and moderately coarse textured, and the lower part is very cobbly and medium textured and is underlain by a hardpan over bedrock.

Of minor extent in this unit are loamy-skeletal Pachic Argixerolls, loamy-skeletal Pachic Haploxerolls, loamy-skeletal Aridic Haploxerolls, clayey-skeletal Xerollic Haplargids, and loamy-skeletal Lithic Haploxerolls. The Pachic Argixerolls, Pachic Haploxerolls, and Aridic Haploxerolls are on side slopes of mountains and support big sagebrush and Idaho fescue. The Xerollic Haplargids are on mountain crests and upper side slopes and support low sagebrush and Thurber needlegrass. The Lithic Haploxerolls are on mountain crests and upper side slopes and support low sagebrush, black sagebrush, and Idaho fescue.

This unit is used for livestock grazing and rangeland wildlife habitat. The main limitations for these uses are stones on the surface and steepness of slope. The Xerollic Durargids are also limited by the shallow depth to the hardpan and low available water capacity. The Aridic Argixerolls are also limited by the shallow depth to the clayey layer.

Broad Land Use Considerations

The soils in this survey area vary widely in their potential for major land uses such as cropland, pasture, rangeland, wildlife habitat, and urbanization. Extensive changes in land use are not expected in the foreseeable future.

About 95 percent of the land area is used as rangeland and for related uses. General soil map units 1 and 2 have the highest potential to produce forage because they are near a water source; however, the soils in these units are limited by the presence of a high water table and an accumulation of salt and sodium. Map units 3 through 10 are used extensively as rangeland. The primary limitation is lack of adequate precipitation. Some of the soils in these units are shallow or moderately deep to a hardpan, which limits rooting depth. Map units 11 through 15 are also used extensively as rangeland. Limitations of the soils in these units include steepness of slope, the fine texture of the lower part of the soils, and depth to a hardpan or bedrock. Map units 16 through 19 are also used as rangeland, but they are limited by steepness of slope. Some of the soils in these units are shallow or moderately deep to bedrock, which limits rooting depth. Some of the soils produce pinyon and juniper trees that are cut for use as fenceposts and firewood.

Almost all of the land in the survey area is used by one or more kinds of wildlife. Pine Creek supports speckled dace, red-sided shiners, and suckers. The tributaries support rainbow, brook, and brown trout.

The openland wildlife common to the area includes valley quail, cottontail, jackrabbit, meadowlark, killdeer, and mule deer. The availability of water and the food and cover provided by the native meadows and pastures are attractive to wildlife.

Detailed Soil Map Units

Definition of map unit

The map units delineated on the detailed maps at the back of this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and limitations of a unit for specific uses. The soil properties and characteristics described can be used to plan the management needed for those uses or for other ones. More information is given under "Use and Management of the Soils" and "Soil Properties."

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to precisely define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes facts about the unit and gives the principal hazards or limitations to be considered in planning for a few specific uses. Soil suitability ratings are given for selected uses, including rangeland seeding, roadfill, daily cover for landfill, shallow excavations, local roads and streets, pond reservoir areas, embankments, dikes, levees, sand, and gravel. The Appendix lists criteria used to develop these ratings.

Soil-physiographic relationships

The detailed soil map units as identified within the survey area reflect the various relationships of soils and component parts of the landscape. Figures 6 and 7 show the soil-physiographic relationships of the area on a three-dimensional basis, which is in contrast to the two-dimensional presentation of the soil map.

Figure 6 shows how some of the delineations appear as they occur throughout the various segments of the landscape. Map units 332, 431, and 881 are typical of those delineations in mountainous areas. Units 1022 and 1202 are on piedmont slopes consisting of fan piedmont remnants, inset fans, and fan skirts. Unit 1281 is part of basin floors and is representative of alluvial flats.

Each map unit has one or more major soil components and generally has several contrasting inclusions. Figure 7 shows the physiographic position of each major soil component identified within the respective map units. Units 332 and 811 are on mountains. The Hopeka soil in unit 332 is on convex side slopes with south, east, and west aspects, and the Cavehill soil is on concave side slopes with north aspects. The Ramires soil in unit 431 is on side slopes with south, east, and west aspects, and the Singletree soil is on side slopes with north aspects. The Quarz soil in unit 811 is on side slopes with south and west aspects, the Highams soil is on side slopes with north and east aspects, and the Atrypa Variant soil is on crests and side slopes. Units 1022 and 1202 are on the piedmont slope. The Nevador soil in unit 1022 is on summits of the upper part of fan piedmont remnants, the Ricert soil is on summits of the lower part of fan piedmont remnants, and the Tulase soil is on inset fans. The Tulase soil in unit 1202 is on fan skirts. The Wendane soil in unit 1281 is on alluvial flats on basin floors.

The unique physiographic position is given in the map unit descriptions for each soil or miscellaneous area identified.

Kinds of map units

Soils that have profiles that are almost alike make up a *soil series*. The soils of a series have major horizons

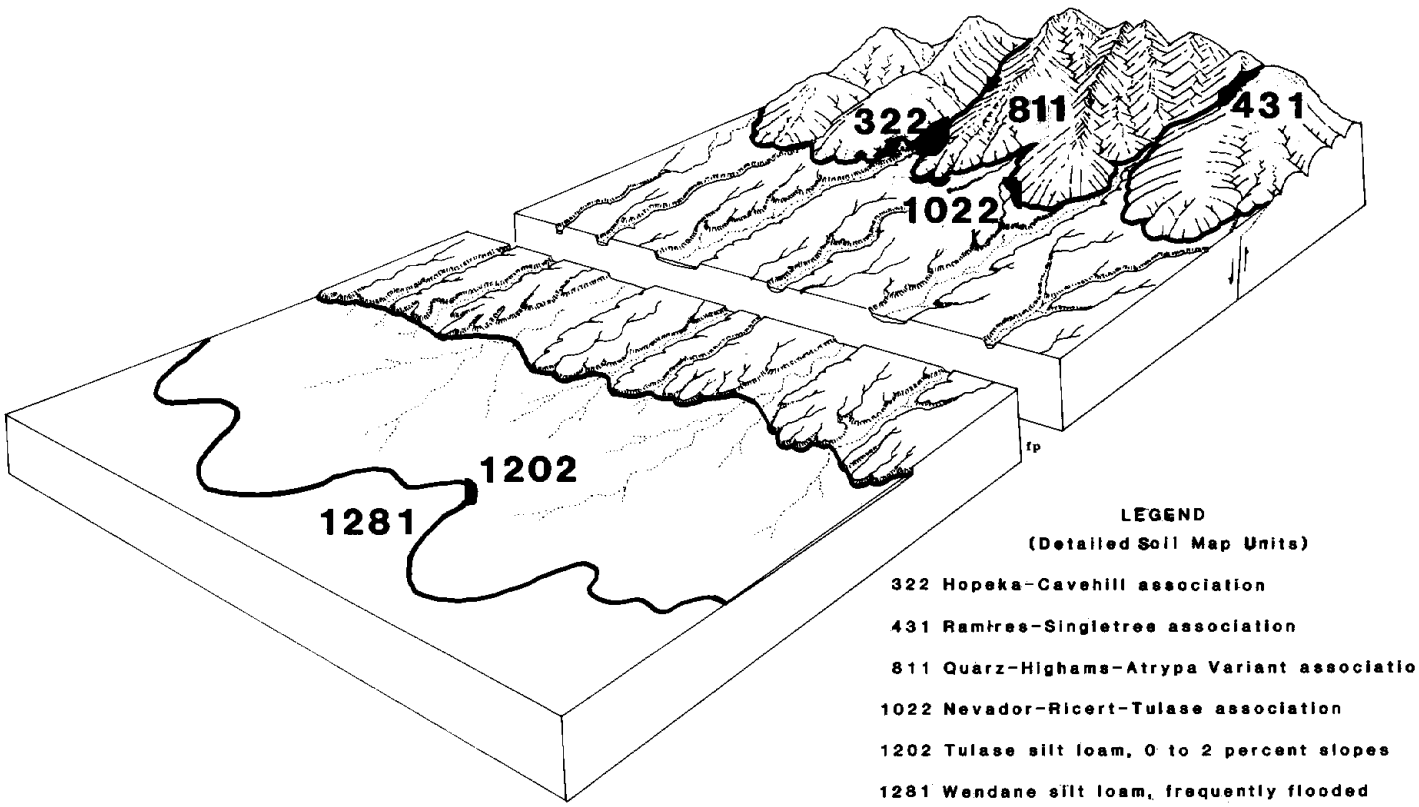


Figure 6.—Appearance of some detailed soil map units as they occur in various positions on the landscape.

that are similar in composition, thickness, and arrangement. Soils of one series can differ in texture of the upper layer or of the underlying layers. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Fenster silt loam, nonsaline-alkali, frequently flooded, is one of several phases in the Fenster series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or associations.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Nuc-Maghills complex, 2 to 8 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Kobeh-Shipley association is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Playas is an example.

The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Detail of mapping

This survey was mapped at two levels of detail. At the most detailed level, map unit boundaries were plotted and verified at closely spaced intervals. At the less detailed level, map unit boundaries were plotted and verified at wider intervals. The narrowly defined units are indicated by an asterisk in the map legend. The detail of mapping was selected to meet the anticipated long-term use of the survey, and the map units were designed to meet the needs for that use.

Acreage and extent

Table 164 gives the acreage and proportionate extent of each map unit.

Explanations of introductory phrases

In the map unit descriptions that follow, a semitabular format is used. In this format a boldface heading (for example, **Composition**), is used to identify the information grouped directly below it. Introducing each item of information under the heading is an italicized term or phrase (for example, *Contrasting inclusions as follows:*) that identifies or describes the information. Many of the headings and introductory terms or phrases are self-explanatory; however, some of them need further explanation. These explanations are provided in the following paragraphs, generally in the order in which they are used in the map unit descriptions. More information is given in the sections "Use and Management of the Soils" and "Soil Properties."

Map unit setting is given for the entire map unit. The setting includes the landscape positions, elevation, and climate. The landscape positions given under "Map unit setting" generally are broader than those given for each major component. The elevation and climatic data given under "Map unit setting" is that applicable for the entire unit and is not given for the individual components.

Composition is given for the components identified in the name of the map unit as well as for the contrasting inclusions.

Inclusions are areas of components (soils or miscellaneous areas) that differ from the soils or miscellaneous areas for which the unit is named. Inclusions can be either similar or contrasting. *Similar inclusions* are components that differ from the components for which the unit is named but that for purposes of use and management can be considered to be the same as the named components. Note that in the "Composition" paragraph a single percentage is provided for a named soil and the similar inclusions because their use and management are similar. Contrasting inclusions are components that differ sufficiently from the components for which the unit is named that they would have different use and management if they were extensive enough to be

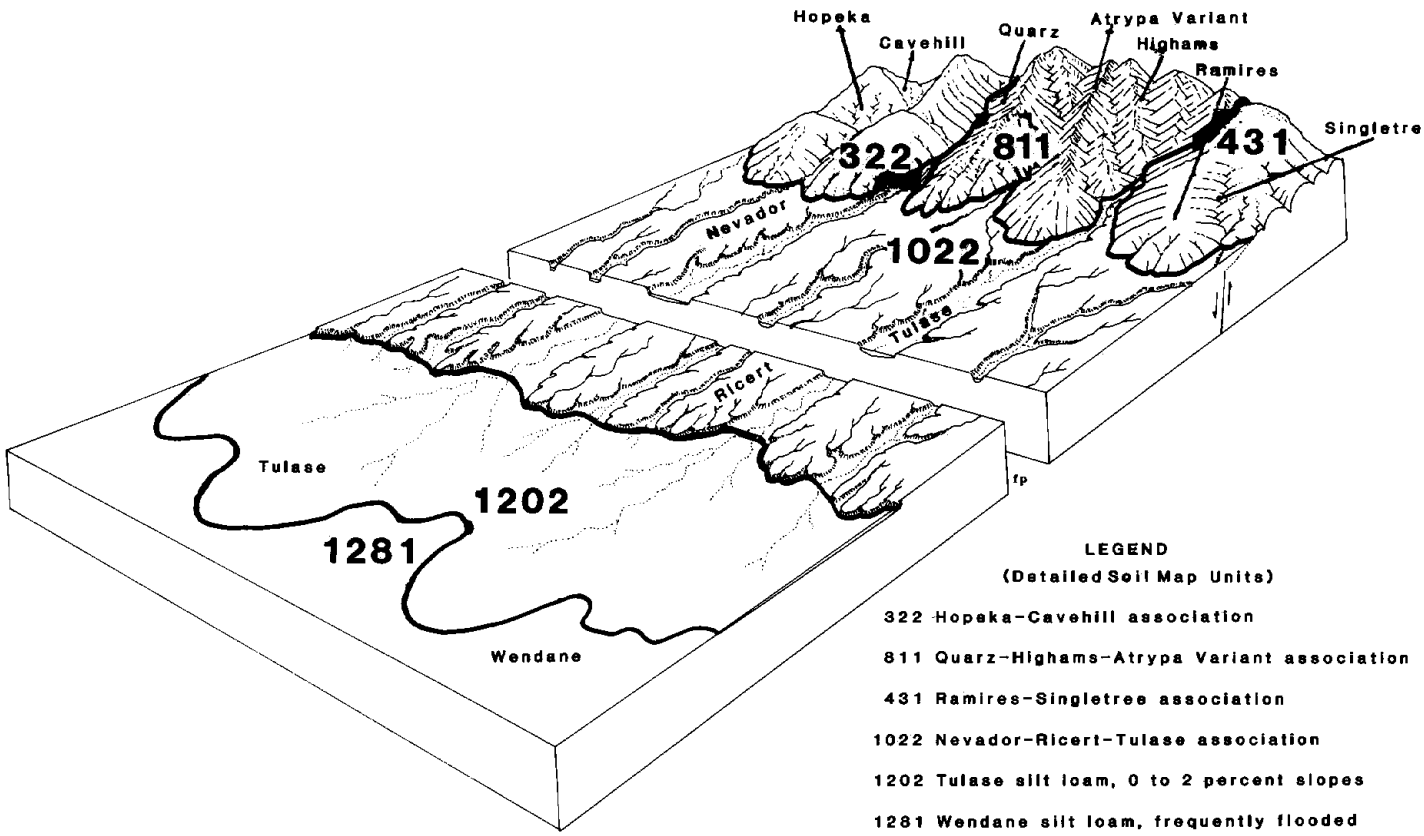


Figure 7.—Landscape position of each major soil component identified within the respective map units.

managed separately. For most uses, contrasting inclusions have limited effect on use and management. Inclusions generally are in small areas, and it is not practical to map them separately because of the scale used. Some small areas of strongly contrasting inclusions are identified by a special symbol on the detailed soil maps. A few inclusions may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the inclusions on the landscape.

Positions on landscape refers to the dominant positions on which the component is located. In naming landscape positions, an effort has been made to give the specific position of the component rather than a general position that could encompass other components. In some instances, however, the component is distributed over a larger landscape to such a degree that it is more nearly accurate to name the larger landscape positions rather than the local ones.

Dominant present vegetation refers to the plants that were growing in noncultivated areas at the time this survey was made. The range condition can be judged by comparing the dominant present vegetation with that in the potential plant community.

Typical profile is a vertical, two-dimensional section of the soil extending from the surface to a restrictive layer or to a depth of 60 inches or more.

Permeability is the quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil.

Available water capacity is the capacity of the soil to hold water available for use by most plants. It commonly is expressed as inches of water per inch of soil (see "Glossary").

*Water supplying capacity*is the total water available in the soil for plant growth in a normal year from the precipitation, runon, and water available from a capillary fringe minus runoff.

Hydrologic soil group is used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. The soils are grouped according to their water intake rate when they are thoroughly wet and receive precipitation from long-duration storms (see "Glossary").

Erosion factors (surface layer) refers to the susceptibility of the soil to erosion. *K value* indicates the susceptibility of a soil to sheet and rill erosion by water. *T value* indicates the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. *Wind erodibility groups* indicate the susceptibility of soil to wind erosion. They are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas (see "Glossary").

Hazard of erosion refers to the hazard if protective cover is removed. The hazard of erosion is constant and cannot be increased or reduced.

Shrink-swell potential refers to the property of the soil that causes it to shrink or swell upon wetting or drying.

Corrosivity refers to the potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. Corrosivity to uncoated steel is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract. Corrosivity to concrete is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing.

Major uses are divided into *current uses* and *potential foreseeable uses*. Current uses are affected by factors such as changes in population patterns and economic considerations. Potential foreseeable uses are those to which the unit is suited or for which the unit could be used if some limitation or limitations were overcome.

Potential native plant community refers to the plant community that would exist if present environmental conditions were to continue without interference by man. Information on plant community is given in the tables. A scientific plant symbol and the common plant name are given *(19)*.

Three remaining topics—elements of wildlife habitat, ratings for selected uses, and interpretive groups—are discussed in this section. Because discussion of these topics is detailed, they are described under separate headings in the following paragraphs. More information is given under "Use and Management of the Soils" and "Soil Properties."

Elements of wildlife habitat

The soils in the survey area are rated according to their suitability for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface

stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, orchardgrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are needlegrass, balsamroot, globemallow, wheatgrass, and bluegrass.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are singleleaf pinyon and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are mountainmahogany, bitterbrush, snowberry, and big sagebrush.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, reed canarygrass, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

Ratings for selected uses

In the detailed map units, the soils are rated for various uses and the most limiting features are identified. The ratings are based on observed performance of the soils and on the estimated data given in the map units and lab test data. In this section the ratings for each use and the limiting features are defined.

Soil interpretations are periodically updated as more is learned about a soil and its behavior under specific uses. New technology can change the relative suitability of a soil for various uses; however, the soil maps remain useful after the soil interpretations originally published with them have become outdated. For this reason, the criteria and guides that were used to make the interpretations presented in the detailed map units are provided in the Appendix. These criteria have been taken directly from the National Soils Handbook *(20)*.

The limitations for shallow excavations, local roads and streets, pond reservoir areas, and embankments, dikes, and levees are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In the detailed map units, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the upper layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Rangeland seeding ratings are intended to be a relative rating that suggests the number of successful seeding establishments that might be expected during a given period of years. In addition, the number of plant species adapted to the soil decreases with decreasing soil suitability.

This rating is not intended to be a measure of the total annual yield. Productivity is dependent upon the interaction of most of the soil properties and characteristics that are considered.

Successful seeding of depleted areas of rangeland in Nevada results in decreased runoff and, subsequently, decreased soil losses from erosion.

Soils that are best suited to seeding are those that are moderately deep or deeper; receive adequate moisture and can hold it; are resistent to sheet, rill, and wind erosion; are free of salts and alkali; and have a medium textured surface layer that is relatively free of rock fragments and is resistent to crusting.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. The soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the upper layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The upper layer generally has the best workability, more organic matter, and the best potential for plants. Material from the upper layer should be stockpiled for use as the final cover.

The soils are rated as a probable or improbable source of *sand* and *gravel*. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. Only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

The limiting features of the soils in this survey area and a brief definition of each follow.

Cemented pan. A cemented pan is too close to the surface for the specified use.

Cutbanks cave. The walls of excavations tend to cave in or slough.

Deep to water. The soil is deep to a permanent water table during dry periods.

Depth to rock. Bedrock is too near the surface for the specified use.

Droughty. The soil holds too little water for plants during dry periods.

Erodes easily. Water erodes the soil easily.

Excess fines. Excess silt and clay are in the soil. The soil does not provide a source of gravel or sand for use in construction.

Excess humus. Too much organic matter is in the soil for the specified use.

Excess lime. The soil has excess carbonates that restrict the growth of some plants.

Excess salt. The soil has excess water-soluble salts that restrict the growth of most plants.

Excess sodium. The soil has excess exchangeable sodium that restricts the growth of plants.

Flooding. The soil is flooded by moving water from stream overflow, runoff, or high tides.

Frost action. The moisture in the soil freezes and thaws. Frost action can damage roads, buildings, and other structures.

Hard to pack. The soil is difficult to compact.

Large stones. The soil has rock fragments that are 3 inches (7.5 centimeters) in diameter or more.

Low strength. The soil is not strong enough to support a load.

No water. Depth to ground water is too great for the specified use.

Piping. Water moving through the soil forms subsurface tunnels or pipelike cavities.

Ponding. Water stands on the soil in closed depressional areas. The water can be removed only by percolation or evapotranspiration.

Rooting depth. The soil is shallow to a layer that greatly restricts roots; shallow root zone.

Salty water. Water is too salty for consumption by livestock.

Seepage. The movement of water through the soil. Seepage adversely affects the specified use of the soil.

Shrink-swell. The soil shrinks when dry and swells when wet.

Slope. The slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specified use.

Slow refill. The restricted permeability of the soil results in slow filling of ponds.

Small stones. The soil has rock fragments that are less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil blowing. The soil is easily moved by wind.

Subsides. The soil settles because of the content of organic matter or the presence of saturated mineral layers.

Too arid. The soil is dry most of the time, and vegetation is difficult to establish.

Too clayey. The soil is slippery and sticky when wet and is slow to dry.

Too sandy. The soil is soft and loose; it is droughty and low in fertility.

Wetness. The soil is wet during the period of use.

Interpretive groups

Land capability classification.—This classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter—e, w, s, or c—to the class numeral, for example, IIe. The letter e shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and c, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by w, s, or c because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

Range site.—The range site symbol given in each map unit identifies a *range site*, which is a distinctive kind of rangeland that produces a characteristic natural plant community that differs from natural plant communities on other range sites in kind, amount, and proportion of range plants. The relationship between soils and vegetation was established during this survey; thus, range sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal water table are also important.

Each detailed soil map unit in this survey includes a table entitled "Rangeland plants and woodland understory." The range sites and woodland understory sites for which data are given in these tables are identified by "range site symbols" and "woodland site symbols," respectively. Additional information on these symbols is available at the local office of the Soil Conservation Service.

Woodland suitability group.—Soils suitable for wood crops are placed in a woodland suitability group and assigned an ordination symbol. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the ordination symbol, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter x indicates stoniness or rockines; w, excessive water in or on the soil; t, toxic substances in the soil; d, restricted root depth; c, clay in the upper part of the soil; s, sandy texture; f, high content of coarse fragments in the soil profile; and r, steep slopes. The letter o indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: r, x, w, t, d, c, s, and f.

Map Unit Descriptions

100—Wholan silt loam, cool, occasionally flooded

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 6,000 to 6,200 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 49 degrees F
Frost-free season—about 90 days

Composition

Wholan silt loam, cool, occasionally flooded, 0 to 2 percent slopes (Typic Camborthids - coarse-silty, mixed, mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Clowfin sandy loam, 0 to 2 percent slopes (Typic Torriorthents - loamy-skeletal, mixed (calcareous), mesic)—8 percent
Inclusion 2: Xerollic Durorthids, 0 to 4 percent slopes—5 percent
Inclusion 3: Umil loam, 0 to 4 percent slopes (Xerollic Durorthids - loamy, mixed, frigid, shallow)—2 percent

Wholan Soil

Positions on landscape: Inset fans
Parent material: Silty loess over silty alluvium
Slope features: Length—short; shape—smooth
Dominant present vegetation: Winterfat, bud sagebrush, Indian ricegrass, halogeton
Typical profile:
0 to 3 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - ML; estimated AASHTO classification - A-4
3 to 60 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Frequency—occasional; duration—brief; months—December through April
Permeability: Moderate
Available water capacity: 10.0 to 11.5 inches
Water supplying capacity: 5 to 8 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—fan skirts; contrasting feature—very gravelly throughout the profile; distinctive present vegetation—winterfat, bud sagebrush, Indian ricegrass, halogeton
Inclusion 2: Position on landscape—fan piedmonts adjacent to inset fans; contrasting feature—silica-

cemented hardpan at a depth of 20 to 40 inches; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass

Inclusion 3: Position on landscape—dissected fan piedmonts adjacent to inset fans; contrasting feature—silica-cemented hardpan at a depth of 10 to 20 inches; distinctive present vegetation—black sagebrush, Indian ricegrass

Major Uses

Current uses: Rangeland, wildlife habitat

Potential foreseeable use: Irrigated cropland if irrigation water is provided

Potential Native Plant Community (Table 1)

Elements of Wildlife Habitat

Suitability for named elements:

Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:

Rangeland seeding: Poor—too arid, excess salt
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding

TABLE 1.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Wholan	1	2	3
Indian ricegrass	ORHY	15-25	20-30	15-25	15-25
Bottlebrush squirreltail	SIHY	2-5	5-10	---	2-5
Needleandthread	STCO4	---	10-20	5-10	---
Sandberg bluegrass	POSE	---	2-5	---	---
Bluebunch wheatgrass	AGSP	---	---	2-5	---
Basin wildrye	ELCI2	---	---	2-5	---
Other perennial grasses	PPGG	5-10	5-10	10-20	5-10
Perennial forbs	PPFF	5-10	2-5	5-10	5-10
Fourwing saltbush	ATCA2	1-2	---	---	1-2
Winterfat	EULA5	30-45	---	5-10	30-45
Wyoming big sagebrush	ARTRW*	---	15-20	---	---
Black sagebrush	ARARN	---	---	20-30	---
Bud sagebrush	ARSP5	---	---	2-5	---
Small rabbitbrush	CHVIS	---	---	2-5	---
Other shrubs	SSSS	5-15	5-10	10-20	5-15
Range site symbol		028B013N	028B010N	028B011N	028B013N
Potential production (lb/acre):					
Favorable years		800	800	900	800
Normal years		600	600	700	600
Unfavorable years		300	400	400	300

Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIw, irrigated, and VIIw, nonirrigated
Range site symbol: 028B013N

101—Wholan-Clowfin association

Map Unit Setting

Positions on landscape: Inset fans, fan skirts
Elevation: 6,000 to 6,400 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 90 days

Composition

Wholan silt loam, cool, occasionally flooded, 0 to 2 percent slopes (Typic Camborthids - coarse-silty, mixed, mesic)—50 percent
Clowfin sandy loam, 2 to 4 percent slopes (Typic Torriorthents - loamy-skeletal, mixed (calcareous), mesic)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Durorthids, 2 to 4 percent slopes—8 percent
Inclusion 2: Haploxerollic Durorthids, 2 to 4 percent slopes—1 percent
Inclusion 3: Wholan silt loam, gullied, 0 to 2 percent slopes (Typic Camborthids - coarse-silty, mixed, mesic)—1 percent

Wholan Soil

Positions on landscape: Inset fans
Parent material: Loess over silty alluvium
Slope features: Length—short; shape—smooth
Dominant present vegetation: Winterfat, bud sagebrush, Indian ricegrass, low rabbitbrush
Typical profile:
0 to 3 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - ML; estimated AASHTO classification - A-4
3 to 60 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Frequency—occasional; duration—very brief; months—December through April
Permeability: Moderate
Available water capacity: 9 to 12 inches
Water supplying capacity: 5 to 8 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Clowfin Soil

Positions on landscape: Fan skirts
Parent material: Mixed alluvium
Slope features: Length—short; shape—smooth
Dominant present vegetation: Winterfat, bud sagebrush, Indian ricegrass, low rabbitbrush
Typical profile:
0 to 4 inches—sandy loam; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-2
4 to 40 inches—stratified very gravelly sandy loam to very gravelly loam; 10 to 25 percent cobbles and stones and 40 to 60 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2, A-4
40 to 60 inches or more—extremely gravelly sand; 5 to 30 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GP, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: In the upper 40 inches—moderately rapid; below this depth—rapid
Available water capacity: 3.0 to 4.5 inches
Water supplying capacity: 4.5 to 7.5 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—3; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—convex fan piedmonts; contrasting feature—indurated lime- and silica-cemented hardpan at a depth of 20 to 40

inches; distinctive present vegetation—black sagebrush, shadscale, low rabbitbrush

Inclusion 2: Position on landscape—convex fan piedmonts; contrasting feature—strongly cemented hardpan at a depth of less than 20 inches; distinctive present vegetation—Utah juniper, big sagebrush, low rabbitbrush

Inclusion 3: Position on landscape—inset fans; contrasting feature—frequently flooded; distinctive present vegetation—Wyoming big sagebrush, rabbitbrush

Major Uses

Current uses: Rangeland, wildlife habitat

Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 2)

TABLE 2.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Wholan	Clowfin	1	2	3
Indian ricegrass	ORHY	15-25	15-25	15-25	X	2-5
Bottlebrush squirreltail	SIHY	2-5	2-5	---	---	2-5
Needleandthread	STCO4	---	---	5-10	X	2-5
Bluebunch wheatgrass	AGSP	---	---	2-5	X	---
Basin wildrye	ELCI2	---	---	2-5	X	10-20
Thurber needlegrass	STTH2	---	---	---	X	---
Bluegrass	POA++	---	---	---	X	---
Other perennial grasses	PPGG	5-10	5-10	10-20	X	5-10
Tapertip hawksbeard	CRAC2	---	---	---	X	---
Other perennial forbs	PPFF	5-10	5-10	5-10	X	5-10
Fourwing saltbush	ATCA2	1-2	1-2	---	---	2-5
Winterfat	EULA5	30-45	30-45	5-10	---	---
Black sagebrush	ARARN	---	---	20-30	---	---
Bud sagebrush	ARSP5	---	---	2-5	---	---
Small rabbitbrush	CHVIS	---	---	2-5	---	---
Wyoming big sagebrush	ARTRW*	---	---	---	X	---
Rabbitbrush	CHRYS9	---	---	---	X	2-5
Utah juniper	JUOS	---	---	---	X	---
Basin big sagebrush	ARTRT*	---	---	---	---	10-15
Nevada ephedra	EPNE	---	---	---	---	2-5
Other shrubs	SSSS	5-15	5-15	10-20	X	5-10
Range site symbol		028B013N	028B013N	028B011N	---	028B009N
Woodland site symbol		---	---	---	025X059N	---
Potential production (lb/acre):						
Favorable years		800	800	900	200	700
Normal years		600	600	700	150	400
Unfavorable years		300	300	400	100	300

Elements of Wildlife Habitat

Suitability of Wholan soil for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor
Suitability of Clowfin soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Wholan Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess salt
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Clowfin Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, droughty
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—flooding
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Moderate—thin layer, seepage, piping
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: Wholan soil—IIw, irrigated, and VIIw, nonirrigated; Clowfin soil—IIIe, irrigated, and VIIc, nonirrigated
Range site symbol: Wholan soil—028B013N; Clowfin soil—028B013N

111—Lien-Hayeston association

Map Unit Setting

Positions on landscape: Ballenas
Elevation: 6,400 to 7,100 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Lien very gravelly loam, 4 to 15 percent slopes (Xerollic Durorthids - loamy-skeletal, mixed, frigid, shallow)—40 percent
Lien very gravelly loam, thick solum, 4 to 15 percent slopes (Xerollic Durorthids - loamy-skeletal, mixed, frigid, shallow)—30 percent
Hayeston sandy loam, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Xeric Torriorthents, 4 to 15 percent slopes (Xeric Torriorthents - loamy-skeletal, carbonatic, frigid)—8 percent
Inclusion 2: Lithic Xerollic Calciorthids, 15 to 50 percent slopes—5 percent
Inclusion 3: Durorthids, very shallow, eroded, 8 to 15 percent slopes—2 percent

Lien Soil

Positions on landscape: Crests and shoulders of ballenas
Parent material: Mixed alluvium influenced by volcanic ash and loess
Slope features: Length—short; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, black sagebrush, Thurber needlegrass, bluegrass
Typical profile:
0 to 4 inches—very gravelly loam; 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2
4 to 8 inches—very gravelly fine sandy loam, very gravelly sandy loam, extremely gravelly loam; 60 to 85 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - GM, GM-GC, GP-GM, GP-GC; estimated AASHTO classification - A-1, A-2
8 to 22 inches—indurated hardpan
Range in depth to hardpan: 7 to 10 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderately rapid
Available water capacity: 0.5 to 1.0 inch
Water supplying capacity: 2 to 4 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.15; T value—1; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Lien, Thick Solum, Soil

Positions on landscape: Crests and side slopes of ballenas
Parent material: Mixed alluvium influenced by volcanic ash and loess
Slope features: Length—short; shape—smooth or slightly concave
Dominant present vegetation: Black sagebrush, rabbitbrush, grasses
Typical profile:
0 to 4 inches—very gravelly loam; 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2
4 to 12 inches—very gravelly fine sandy loam, very gravelly sandy loam, extremely gravelly loam; 60 to 85 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - GM, GM-GC, GP-GM, GP-GC; estimated AASHTO classification - A-1, A-2
12 to 22 inches—indurated hardpan
Range in depth to hardpan: 10 to 14 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderately rapid
Available water capacity: 0.5 to 1.0 inch
Water supplying capacity: 2 to 4 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.15; T value—1; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low

Potential frost action: Moderate

Hayeston Soil

Positions on landscape: Inset fans
Parent material: Mixed alluvium
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, Thurber needlegrass
Typical profile:
0 to 4 inches—sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, frigid; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-2, A-4
4 to 27 inches—fine sandy loam, coarse sandy loam, sandy loam; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, GM; estimated AASHTO classification - A-2, A-4
27 to 60 inches or more—stratified very gravelly loamy sand to extremely gravelly sand; 50 to 75 percent pebbles (by weight); massive; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GP-GM, GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: In the upper 27 inches—moderately rapid; below this depth—rapid
Available water capacity: 4 to 6 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—severe
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—alluvial fans; contrasting feature—more than 40 percent lime throughout the profile; distinctive present vegetation—black sagebrush, grasses
Inclusion 2: Position on landscape—lower side slopes of adjacent mountains; contrasting feature—bedrock at a depth of less than 20 inches; distinctive present vegetation—singleleaf pinyon, Utah juniper
Inclusion 3: Position on landscape—convex erosional shoulders of ballenas; contrasting feature—hardpan at a depth of less than 7 inches; distinctive present vegetation—scattered big sagebrush, black sagebrush, grasses

Major Uses

Rangeland, woodland, wildlife habitat

Potential Native Plant Community (Table 3)

Woodland

Lien Soil

Site index for common trees: Singleleaf pinyon—35; Utah juniper—35
Most important native understory plants: Indian ricegrass, bluebunch wheatgrass, black sagebrush

Elements of Wildlife Habitat

Suitability of Lien soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Coniferous plants (nonirrigated)—poor
Suitability of Lien, thick solum, soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Hayeston soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Lien Soil and Lien, Thick Solum, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, cemented pan, small stones, surface rock fragments
Roadfill: Poor—cemented pan
Daily cover for landfill: Severe—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Severe—cemented pan
Pond reservoir areas: Severe—cemented pan, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Hayeston Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones, too sandy

TABLE 3.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Lien	Lien, thick solum	Hayeston	1	2	3
Indian ricegrass	ORHY	X	15-25	20-30	X	15-25	10-30
Pine bluegrass	POSC	X	---	---	X	---	---
Bluebunch wheatgrass	AGSP	X	2-5	---	X	2-5	---
Thurber needlegrass	STTH2	X	---	---	X	---	---
Bottlebrush squirreltail	SIHY	X	---	5-10	X	---	5-10
Sandberg bluegrass	POSE	X	---	2-5	X	---	---
Black sagebrush	ARARN	X	20-30	---	X	20-30	5-15
Needleandthread	STCO4	---	5-10	10-20	---	5-10	---
Basin wildrye	ELCI2	---	2-5	---	---	2-5	---
Other perennial grasses	PPGG	X	10-20	5-10	X	10-20	10-20
Perennial forbs	PPFF	X	5-10	2-5	X	5-10	---
Utah juniper	JUOS	X	---	---	X	---	---
Singleleaf pinyon	PIMO	X	---	---	X	---	---
Bud sagebrush	ARSP5	---	2-5	---	---	2-5	---
Winterfat	EULA5	---	5-10	---	---	5-10	---
Small rabbitbrush	CHVIS	---	2-5	---	---	2-5	---
Wyoming big sagebrush	ARTRW*	---	---	15-20	---	---	10-25
Other shrubs	SSSS	X	10-20	5-10	X	10-20	2-5
Range site symbol		---	028B011N	028B010N	---	028B011N	025X025N
Woodland site symbol		025X063N	---	---	025X063N	---	---
Potential production (lb/acre):							
Favorable years		400	900	800	400	900	200
Normal years		300	700	600	300	700	150
Unfavorable years		200	400	400	200	400	100

Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—flooding, frost action
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: Lien soil—VIIs, nonirrigated; Lien, thick solum, soil—VIIs, nonirrigated; Hayeston soil—IIIe, irrigated, and VIIc, nonirrigated
Range site symbol: Lien, thick solum, soil—028B011N; Hayeston soil—028B010N
Woodland suitability group: Lien soil—3d

121—Piltdown fine sandy loam

Map Unit Setting

Positions on landscape: Fan skirts
Elevation: 5,900 to 6,200 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 49 degrees F
Frost-free season—about 90 days

Composition

Piltdown fine sandy loam, 0 to 2 percent slopes (Typic Torriorthents - coarse-loamy, mixed (calcareous), mesic)—95 percent
Contrasting inclusion as follows:
Inclusion 1: Xeric Torriorthents, 0 to 2 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), mesic)—5 percent

Piltdown Soil

Positions on landscape: Fan skirts
Parent material: Mixed alluvium influenced by loess
Slope features: Length—short; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, halogeton, mustard
Typical profile:
0 to 6 inches—fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; soft, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
6 to 60 inches or more—fine sandy loam, sandy loam, very fine sandy loam; 0 to 25 percent pebbles (by weight); subangular blocky structure; soft, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - SM; estimated AASHTO classification - A-2, A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Moderate
Available water capacity: 7 to 9 inches
Water supplying capacity: 5 to 7 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.28; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusion

Inclusion 1: Position on landscape—slightly concave fan skirts; contrasting feature—higher effective moisture; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass, needleandthread

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 4)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—flooding
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIIc, irrigated, and VIIc, nonirrigated
Range site symbol: 028B017N

TABLE 4.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	Inclusion number--
		Piltdown	1
Bottlebrush squirreltail	SIHY	2-5	5-10
Needleandthread	STCO4	5-10	10-20
Indian ricegrass	ORHY	5-10	20-30
Sandberg bluegrass	POSE	---	2-5
Other perennial grasses	PPGG	5-10	5-10
Perennial forbs	PPFF	5-10	2-5
Shadscale	ATCO	30-40	---
Bud sagebrush	ARSP5	5-10	---
Fourwing saltbush	ATCA2	3-5	---
Winterfat	EULA5	2-5	---
Wyoming big sagebrush	ARTRW*	---	15-20
Other shrubs	SSSS	5-15	5-10
Range site symbol		028B017N	028B010N
Potential production (lb/acre):			
Favorable years		700	800
Normal years		500	600
Unfavorable years		250	400

131—Pumper sandy loam, cool

Map Unit Setting

Positions on landscape: Fan skirts
Elevation: 5,900 to 6,200 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 50 degrees F
Frost-free season—about 90 days

Composition

Pumper sandy loam, cool, 0 to 2 percent slopes (Typic Camborthids - sandy-skeletal, mixed, mesic)—95 percent
Contrasting inclusions as follows:
Inclusion 1: Clowfin sandy loam, 0 to 2 percent slopes (Typic Torriorthents - loamy-skeletal, mixed (calcareous), mesic)—3 percent
Inclusion 2: Broyles silt loam, cool, 0 to 2 percent slopes (Duric Camborthids - coarse-loamy, mixed, mesic)—2 percent

Pumper Soil

Positions on landscape: Fan skirts
Parent material: Loess with high content of volcanic ash over gravelly alluvium
Slope features: Length—short; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, winterfat, needleandthread
Typical profile:
0 to 13 inches—sandy loam; 0 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
13 to 60 inches or more—stratified very gravelly sand to extremely gravelly coarse sand; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - GP; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 13 inches—moderate; below this depth—rapid
Available water capacity: 2.7 to 4.5 inches
Water supplying capacity: 5 to 7 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—slightly concave fan skirts; contrasting feature—very gravelly sandy loam at a depth of 10 to 40 inches; distinctive present vegetation—winterfat, bud sagebrush
Inclusion 2: Position on landscape—smooth stream terraces adjacent to fan skirts; contrasting features—less than 35 percent pebbles throughout the profile, weak silica cementation at a depth of 12 to 40 inches; distinctive present vegetation—shadscale, bud sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 5)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—very poor
Shallow water areas—very poor

Ratings for Selected Uses

Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: IVs, irrigated, and VIIc, nonirrigated
Range site symbol: 028B014N

TABLE 5.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Pumper	1	2
Indian ricegrass	ORHY	5-15	5-10	15-25
Needleandthread	STCO4	5-10	5-10	---
Bottlebrush squirreltail	SIHY	2-5	2-5	2-5
Sand dropseed	SPCR	2-5	---	---
Other perennial grasses	PPGG	5-10	5-10	5-10
Perennial forbs	PPFF	5-15	5-10	5-10
Bud sagebrush	ARSP5	2-5	5-10	---
Winterfat	EULA5	10-15	2-5	30-45
Fourwing saltbush	ATCA2	10-20	3-5	1-2
Ephedra	EPHED	2-5	---	---
Shadscale	ATCO	---	30-40	---
Other shrubs	SSSS	10-15	5-15	5-15
Range site symbol		028B014N	028B017N	028B013N
Potential production (lb/acre):				
Favorable years		450	700	800
Normal years		300	500	600
Unfavorable years		125	250	300

141—Pedoli-Poorcal association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 6,300 to 7,000 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 90 days

Composition

Pedoli loam, 0 to 4 percent slopes (Xerollic Haplargids - fine-loamy, mixed, frigid)—65 percent
Poorcal loam, 0 to 4 percent slopes (Durixerollic Calciorthids - coarse-loamy, mixed, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Durorthids, 0 to 4 percent slopes—10 percent
Inclusion 2: Xeric Torriorthents, 2 to 4 percent slopes—5 percent

Pedoli Soil

Positions on landscape: Summits of dissected fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—short; shape—slightly concave
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, Indian ricegrass
Typical profile:
0 to 4 inches—loam; 0 to 10 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
4 to 16 inches—gravelly loam, gravelly clay loam, clay loam, loam; 15 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, GC, SC; estimated AASHTO classification - A-6, A-7
16 to 60 inches or more—stratified gravelly loam to very gravelly loamy sand; 50 to 65 percent pebbles (by weight); massive; soft, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM, GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately slow
Available water capacity: 4.5 to 6.5 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.28; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Poorcal Soil

Positions on landscape: Inset fans
Parent material: Kind—mixed alluvium influenced by loess and volcanic ash; source—calcareous rock
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, Indian ricegrass, winterfat
Typical profile:
0 to 5 inches—loam; 0 to 10 percent pebbles (by weight); granular structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 29 inches—gravelly sandy loam, loam, gravelly loam; 15 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC; estimated AASHTO classification - A-1, A-2
29 to 60 inches or more—very gravelly loamy sand, very gravelly sandy loam, very gravelly loam; 50 to 60 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 4.0 to 5.5 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.32; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—higher summits of fan piedmont remnants; contrasting feature—

indurated silica-cemented hardpan at a depth of 20 to 40 inches; distinctive present vegetation—black sagebrush, winterfat, needleandthread

Inclusion 2: Position on landscape—along shallow drainage channels on inset fans; contrasting feature—does not have a layer of lime or clay accumulation; distinctive present vegetation—Wyoming big sagebrush, rabbitbrush, Indian ricegrass

Major Uses

Current uses: Rangeland, wildlife habitat

Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 6)

Elements of Wildlife Habitat

Suitability of Pedoli soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Suitability of Poorcal soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

TABLE 6.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Pedoli	Poorcal	1	2
Indian ricegrass	ORHY	20-30	20-30	15-25	20-30
Needleandthread	STCO4	10-20	10-20	5-10	10-20
Bottlebrush squirreltail	SIHY	5-10	5-10	---	5-10
Sandberg bluegrass	POSE	2-5	2-5	---	2-5
Bluebunch wheatgrass	AGSP	---	---	2-5	---
Basin wildrye	ELCI2	---	---	2-5	---
Other perennial grasses	PPGG	5-10	5-10	10-20	5-10
Perennial forbs	PPFF	2-5	2-5	5-10	2-5
Wyoming big sagebrush	ARTRW*	15-20	15-20	---	15-20
Black sagebrush	ARARN	---	---	20-30	---
Bud sagebrush	ARSP5	---	---	2-5	---
Winterfat	EULA5	---	---	5-10	---
Small rabbitbrush	CHVIS	---	---	2-5	---
Other shrubs	SSSS	5-10	5-10	10-20	5-10
Range site symbol		028B010N	028B010N	028B011N	028B010N
Potential production (lb/acre):					
Favorable years		800	800	900	800
Normal years		600	600	700	600
Unfavorable years		400	400	400	400

Ratings for Selected Uses

Pedoli Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action, shrink-swell
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Poorcal Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Pedoli soil—IIIe, irrigated, and VIIc, nonirrigated; Poorcal soil—IVe, irrigated, and VIIc, nonirrigated
Range site symbol: Pedoli soil—028B010N; Poorcal soil—028B010N

142—Pedoli-Shipley association

Map Unit Setting

Positions on landscape: Lower part of fan piedmonts
Elevation: 6,400 to 7,000 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 90 days

Composition

Pedoli loam, 0 to 4 percent slopes (Xerollic Haplargids - fine-loamy, mixed, frigid)—80 percent
Shipley fine sandy loam, occasionally flooded, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Camborthids, 0 to 4 percent slopes—3 percent
Inclusion 2: Aridic Haploxerolls, 0 to 4 percent slopes—2 percent

Pedoli Soil

Positions on landscape: Summits of slightly dissected fan-piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, Indian ricegrass, bottlebrush squirreltail, needleandthread
Typical profile:
0 to 4 inches—loam; 0 to 10 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
4 to 16 inches—gravelly loam, gravelly clay loam, clay loam, loam; 15 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, GC, SC; estimated AASHTO classification - A-6, A-7
16 to 60 inches or more—stratified gravelly loam to very gravelly loamy sand; 50 to 65 percent pebbles (by weight); massive; soft, friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM, GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately slow
Available water capacity: 4.5 to 6.8 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.28; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Shipley Soil

Positions on landscape: Inset fans
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Winterfat, bud sagebrush, rabbitbrush, Indian ricegrass
Typical profile:
0 to 9 inches—fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
9 to 41 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - SM; estimated AASHTO classification - A-2
41 to 60 inches or more—stratified gravelly loam to very gravelly sandy loam; 35 to 60 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - GM, SM; estimated AASHTO classification - A-1, A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Frequency—occasional; duration—very brief; months—February through July
Permeability: Moderate
Available water capacity: 6.7 to 7.9 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.37; T value—3; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—side slopes of fan piedmont remnants and outer parts of inset fans; contrasting features—does not flood, does not have a layer of clay accumulation; distinctive present vegetation—Wyoming big sagebrush, rabbitbrush, Indian ricegrass, bottlebrush squirreltail, needleandthread

Inclusion 2: Position on landscape—swales of inset fans; contrasting features—dark colored in the upper 10 inches, higher water supplying capacity; distinctive present vegetation—Wyoming big sagebrush, rabbitbrush, Indian ricegrass, bottlebrush squirreltail, needleandthread

Major Uses

Current uses: Rangeland, wildlife habitat

Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 7)

Elements of Wildlife Habitat

Suitability of Pedoli soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Suitability of Shipley soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

TABLE 7.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Pedoli	Shipley	1	2
Indian ricegrass	ORHY	20-30	15-25	20-30	20-30
Needleandthread	STCO4	10-20	---	10-20	10-20
Bottlebrush squirreltail	SIHY	5-10	2-5	5-10	5-10
Sandberg bluegrass	POSE	2-5	---	2-5	2-5
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10
Perennial forbs	PPFF	2-5	5-10	2-5	2-5
Wyoming big sagebrush	ARTRW*	15-20	---	15-20	15-20
Fourwing saltbush	ATCA2	---	1-2	---	---
Winterfat	EULA5	---	30-45	---	---
Other shrubs	SSSS	5-10	5-15	5-10	5-10
Range site symbol		028B010N	028B013N	028B010N	028B010N
Potential production (lb/acre):					
Favorable years		800	800	800	800
Normal years		600	600	600	600
Unfavorable years		400	300	400	400

Ratings for Selected Uses

Pedoli Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action, shrink-swell
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Shipley Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Pedoli soil—IIIe, irrigated, and VIIc, nonirrigated; Shipley soil—IIIw, irrigated, and VIw, nonirrigated
Range site symbol: Pedoli soil—028B010N; Shipley soil—028B013N

143—Pedoli-Silverado association

Map Unit Setting

Positions on landscape: Fan piedmonts, fan skirts
Elevation: 6,100 to 6,700 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 90 days

Composition

Pedoli loam, 0 to 4 percent slopes (Xerollic Haplargids - fine-loamy, mixed, frigid)—60 percent
Silverado sandy loam, 0 to 8 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, frigid)—30 percent
Contrasting inclusion as follows:
Inclusion 1: Hayeston sandy loam, 2 to 8 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—10 percent

Pedoli Soil

Positions on landscape: Broad summits of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, Indian ricegrass, needleandthread
Typical profile:
0 to 4 inches—loam; 0 to 10 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
4 to 16 inches—gravelly loam, gravelly clay loam, clay loam, loam; 15 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, GC, SC; estimated AASHTO classification - A-6, A-7
16 to 60 inches or more—stratified gravelly loam to very gravelly loamy sand; 50 to 65 percent pebbles (by weight); massive; soft, friable; moderately alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM, GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately slow
Available water capacity: 4.5 to 6.8 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.28; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Silverado Soil

Positions on landscape: Broad fan skirts
Parent material: Mixed alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, Indian ricegrass, needleandthread
Typical profile:
0 to 6 inches—sandy loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; neutral (pH 7.1); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
6 to 14 inches—sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
14 to 35 inches—gravelly sandy loam, sandy loam; 15 to 35 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, SM; estimated AASHTO classification - A-1
35 to 60 inches or more—very gravelly coarse sand; 55 to 65 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GP; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 35 inches—moderately rapid; below this depth—very rapid
Available water capacity: 4.2 to 5.5 inches
Water supplying capacity: 7 to 9 inches
Runoff: Slow to medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.32; T value—3; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low

Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusion

Inclusion 1: Position on landscape—inset fans; contrasting feature—does not have a layer of clay accumulation, does not have weak silica cementation; distinctive present vegetation—Wyoming big sagebrush, rabbitbrush, Indian ricegrass, needleandthread

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 8)

Elements of Wildlife Habitat

Suitability of Pedoli soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor
Suitability of Silverado soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Pedoli Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave

TABLE 8.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		Inclusion number--
		Pedoli	Silverado	1
Indian ricegrass	ORHY	20-30	20-30	20-30
Needleandthread	STCO4	10-20	10-20	10-20
Bottlebrush squirreltail	SIHY	5-10	5-10	5-10
Sandberg bluegrass	POSE	2-5	2-5	2-5
Other perennial grasses	PPGG	5-10	5-10	5-10
Perennial forbs	PPFF	2-5	2-5	2-5
Wyoming big sagebrush	ARTRW*	15-20	15-20	15-20
Other shrubs	SSSS	5-10	5-10	5-10
Range site symbol		028B010N	028B010N	028B010N
Potential production (lb/acre):				
Favorable years		800	800	800
Normal years		600	600	600
Unfavorable years		400	400	400

Local roads and streets: Moderate—frost action, shrink-swell
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Silverado Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones, too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: Pedoli soil—IIIe, irrigated, and VIIc, nonirrigated; Silverado soil—IVe, irrigated, and VIIc, nonirrigated
Range site symbol: Pedoli soil—028B010N; Silverado soil—028B010N

155—Sonoma silt loam, frequently flooded, strongly saline

Map Unit Setting

Positions on landscape: Basin floor remnants
Elevation: 5,600 to 5,700 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 50 degrees F
Frost-free season—about 100 days

Composition

Sonoma silt loam, frequently flooded, strongly saline, 0 to 2 percent slopes (Aeric Fluvaquents - fine-silty, mixed (calcareous), mesic)—90 percent
Contrasting inclusions as follows:
Inclusion 1: Ocala silty clay loam, occasionally flooded (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—5 percent
Inclusion 2: Aquic Durorthidic Torriorthents - fine-silty over clayey, mixed (calcareous), mesic)—5 percent

Sonoma Soil

Positions on landscape: Basin floor remnants, near seeps and hot springs
Parent material: Silty alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Black greasewood, inland saltgrass, alkali sacaton, basin wildrye
Typical profile:
0 to 13 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - CL; estimated AASHTO classification - A-6
13 to 60 inches or more—stratified silt loam to silty clay loam; massive; slightly hard, friable; very strongly alkaline (pH 9.2); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - CL; estimated AASHTO classification - A-6, A-7
Depth to seasonal high water table: 18 to 36 inches
Hazard of flooding: Frequency—frequent; duration—brief to long; months—February through June
Permeability: Moderately slow
Available water capacity: 11.0 to 12.5 inches
Water supplying capacity: 10 to 15 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth alluvial flats; contrasting feature—durinodes and weak cementation at a depth of 13 inches; distinctive present vegetation—black greasewood, alkali sacaton, inland saltgrass, basin wildrye
Inclusion 2: Position on landscape—remnants of lake-plain terraces; contrasting feature—clayey in the lower layer, weak silica cementation; distinctive present vegetation—black greasewood, alkali sacaton, inland saltgrass, basin wildrye

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 9)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess salt
Roadfill: Poor—low strength
Daily cover for landfill: Poor—excess salt
Shallow excavations: Severe—wetness
Local roads and streets: Severe—low strength, frost action, flooding
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—wetness, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIw, nonirrigated
Range site symbol: 024X007N

TABLE 9.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Sonoma	1	2
Basin wildrye	ELCI2	40-60	40-60	40-60
Alkali sacaton	SPAI	15-30	15-30	15-30
Inland saltgrass	DIST	5-10	5-10	5-10
Other perennial grasses	PPGG	2-4	2-4	2-4
Povertyweed	IVAX	1-2	1-2	1-2
Other perennial forbs	PPFF	2-4	2-4	2-4
Black greasewood	SAVE4	5-15	5-15	5-15
Rubber rabbitbrush	CHNA2	2-5	2-5	2-5
Other shrubs	SSSS	2-5	2-5	2-5
Range site symbol		024X007N	024X007N	024X007N
Potential production (lb/acre):				
Favorable years		1,900	1,900	1,900
Normal years		1,400	1,400	1,400
Unfavorable years		800	800	800

160—Ocala association

Map Unit Setting

Positions on landscape: Alluvial flats
Elevation: 5,500 to 6,200 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Ocala silt loam, occasionally flooded, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—45 percent
Ocala silt loam, rarely flooded, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—45 percent
Contrasting inclusions as follows:
Inclusion 1: Typic Torriorthents—6 percent
Inclusion 2: Typic Haplaquolls—4 percent

Ocala, Occasionally Flooded, Soil

Positions on landscape: Alluvial flats
Parent material: Silty alluvium influenced by volcanic ash
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Black greasewood, rabbitbrush, inland saltgrass, basin big sagebrush
Typical profile:
0 to 14 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 20 to 40); estimated Unified classification - ML, CL; estimated AASHTO classification - A-4, A-6
14 to 60 inches or more—silt loam, silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML, CL; estimated AASHTO classification - A-6, A-7
Depth to seasonal high water table: In February to June—36 to 40 inches; rest of year—more than 40 inches
Hazard of flooding: Frequency—occasional; duration—long; months—March through June
Permeability: Slow
Available water capacity: 11.0 to 12.5 inches
Water supplying capacity: 9 to 10 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: High

Ocala, Rarely Flooded, Soil

Positions on landscape: Slightly higher areas of alluvial flats
Parent material: Silty alluvium influenced by volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Black greasewood, shadscale, rabbitbrush
Typical profile:
0 to 3 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 20 to 30); estimated Unified classification - ML, CL; estimated AASHTO classification - A-4, A-6
3 to 14 inches—silt loam, silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML, CL; estimated AASHTO classification - A-6, A-7
14 to 60 inches or more—silt loam, silty clay loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML, CL; estimated AASHTO classification - A-6, A-7
Depth to seasonal high water table: In February to June—40 to 60 inches; rest of year—more than 60 inches
Hazard of flooding: Rare
Permeability: Slow
Available water capacity: 11.0 to 12.5 inches
Water supplying capacity: 6 to 8 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—swales on alluvial flats; contrasting feature—darker colored in the upper layer; distinctive present vegetation—alkali sacaton, alkali muhly, alkali cordgrass
Inclusion 2: Position on landscape—smooth fan skirts; contrasting feature—well drained; distinctive present vegetation—shadscale, bud sagebrush, black greasewood

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 10)

Elements of Wildlife Habitat

Suitability of Ocala, occasionally flooded, soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—fair

Suitability of Ocala, rarely flooded, soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—fair

Ratings for Selected Uses

Ocala, Occasionally Flooded, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess sodium, excess salt
Roadfill: Poor—low strength
Daily cover for landfill: Poor—excess salt, excess sodium
Shallow excavations: Moderate—wetness, flooding

TABLE 10.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Ocala, occasionally flooded	Ocala, rarely flooded	1	2
Inland saltgrass	DIST	5-10	5-8	---	T-2
Basin wildrye	ELCI2	5-15	2-5	---	T-2
Alkali sacaton	SPAI	20-30	5-10	30-40	---
Alkali cordgrass	SPGR	---	---	5-10	---
Alkali muhly	MUAS	---	---	5-15	---
Bottlebrush squirreltail	SIHY	---	---	---	7-10
Other perennial grasses	PPGG	10-20	2-5	10-15	---
Miterwort	NITRO	---	---	---	2-3
Other perennial forbs	PPFF	5-10	2-5	5-10	T-3
Basin big sagebrush	ARTRT*	2-5	---	---	---
Black greasewood	SAVE4	5-10	50-60	---	20-30
Fourwing saltbush	ATCA2	2-5	---	---	---
Rubber rabbitbrush	CHNA2	2-5	---	---	---
Shadscale	ATCO	---	2-5	---	30-40
Bud sagebrush	ARSP5	---	---	---	5-10
Seepweed	SUAED	---	---	---	5-15
Other shrubs	SSSS	2-5	5-10	5-10	---
Range site symbol		028B004N	028B020N	028B002N	024X003N
Potential production (lb/acre):					
Favorable years		2,000	600	3,000	600
Normal years		1,000	450	1,500	450
Unfavorable years		500	200	700	300

Local roads and streets: Severe—low strength, flooding, frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess sodium, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Ocala, Rarely Flooded, Soil

Rangeland seeding: Poor—too arid, excess sodium, excess salt
Roadfill: Poor—low strength
Daily cover for landfill: Poor—excess sodium
Shallow excavations: Moderate—wetness
Local roads and streets: Severe—low strength, frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess sodium, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIw, nonirrigated
Range site symbol: Ocala, occasionally flooded, soil—028B004N; Ocala, rarely flooded, soil—028B020N

161—Ocala silt loam, occasionally flooded

Map Unit Setting

Positions on landscape: Alluvial flats
Elevation: 5,500 to 6,200 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Ocala silt loam, occasionally flooded, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Xeric Torriorthents, 0 to 2 percent slopes—7 percent
Inclusion 2: Xeric Torriorthents, 0 to 4 percent slopes—5 percent
Inclusion 3: Broyles silt loam, 0 to 4 percent slopes (Duric Camborthids - coarse-loamy, mixed, mesic)—3 percent

Ocala Soil

Positions on landscape: Alluvial flats
Parent material: Silty alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, rabbitbrush, inland saltgrass, basin big sagebrush
Typical profile:
0 to 14 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 20 to 40); estimated Unified classification - ML, CL; estimated AASHTO classification - A-4, A-6
14 to 60 inches or more—silt loam, silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML, CL; estimated AASHTO classification - A-6, A-7
Depth to seasonal high water table: In February through June—36 to 40 inches; rest of year—more than 60 inches
Hazard of flooding: Frequency—occasional; duration—long; months—March through June
Permeability: Slow
Available water capacity: 11.5 to 12.5 inches
Water supplying capacity: 9 to 10 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans; contrasting features—slightly saline in the upper layer, moderately well drained; distinctive present vegetation—alkali muhly, basin big sagebrush
Inclusion 2: Position on landscape—smooth stream terraces; contrasting features—slightly saline in the upper layer, moderately well drained; distinctive present vegetation—black greasewood, basin big sagebrush
Inclusion 3: Position on landscape—smooth, slightly convex fan skirts; contrasting features—well drained, nonsaline (less than 2 mmhos/cm); distinctive present vegetation—shadscale, bud sagebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 11)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess sodium, excess salt
Roadfill: Poor—low strength
Daily cover for landfill: Poor—excess salt, excess sodium
Shallow excavations: Moderate—wetness, flooding
Local roads and streets: Severe—low strength, flooding, frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess sodium, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIw, nonirrigated
Range site symbol: 028B004N

TABLE 11.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Ocala	1	2	3
Inland saltgrass	DIST	5-10	---	---	2-5
Basin wildrye	ELCI2	5-15	5-10	---	50-60
Alkali sacaton	SPAI	20-30	---	---	---
Indian ricegrass	ORHY	---	2-5	5-15	---
Bottlebrush squirreltail	SIHY	---	2-5	5-10	2-5
Bluegrass	POA++	---	---	2-5	---
Western wheatgrass	AGSM	---	---	---	5-10
Mat muhly	MURI	---	---	---	2-5
Other perennial grasses	PPGG	10-20	2-5	---	2-5
Thelypody	THELY	---	2-4	---	---
Globemallow	SPHAE	---	1-2	---	---
Povertyweed	IVAX	---	---	---	1-2
Other perennial forbs	PPFF	5-10	1-2	2-4	2-3
Basin big sagebrush	ARTRT*	2-5	10-25	---	15-20
Black greasewood	SAVE4	5-10	20-30	---	2-5
Fourwing saltbush	ATCA2	2-5	---	---	---
Rubber rabbitbrush	CHNA2	2-5	---	---	2-5
Spiny hopsage	GRSP	---	5-15	---	---
Shadscale	ATCO	---	---	30-35	---
Bud sagebrush	ARSP5	---	---	25-30	---
Other shrubs	SSSS	2-5	2-10	2-5	2-4
Range site symbol		028B004N	024X022N	024X002N	024X006N
Potential production (lb/acre):					
Favorable years		2,000	800	700	1,500
Normal years		1,000	600	450	1,100
Unfavorable years		500	350	300	600

164—Ocala silt loam, rarely flooded

Map Unit Setting

Positions on landscape: Alluvial flats
Elevation: 5,600 to 5,700 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 49 degrees F
Frost-free season—about 110 days

Composition

Ocala silt loam, rarely flooded, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Aquic Durorthidic Torriorthents - fine-silty over clayey, mixed (calcareous), mesic—5 percent
Inclusion 2: Sonoma silt loam, strongly saline (Aeric Fluvaquents - fine-silty, mixed (calcareous), mesic—5 percent
Inclusion 3: Aeric Halaquepts - fine, montmorillonitic (calcareous), mesic—5 percent

Ocala, Rarely Flooded, Soil

Positions on landscape: Alluvial flats
Parent material: Silty alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, rabbitbrush, shadscale
Typical profile:
0 to 3 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 20 to 30); estimated Unified classification - ML, CL; estimated AASHTO classification - A-4, A-6
3 to 14 inches—silt loam, silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML, CL; estimated AASHTO classification - A-6, A-7
14 to 60 inches or more—silt loam, silty clay loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML, CL; estimated AASHTO classification - A-6, A-7
Depth to seasonal high water table: In February to June—40 to 60 inches; rest of year—more than 60 inches
Hazard of flooding: Rare
Permeability: Slow
Available water capacity: 11.0 to 12.5 inches
Water supplying capacity: 6 to 8 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth fan skirts; contrasting features—clay layer at a depth of 20 to 40 inches, lower sodicity; distinctive present vegetation—alkali sacaton, inland saltgrass, black greasewood
Inclusion 2: Position on landscape—basin floor remnants; contrasting features—lower sodicity, poorly drained; distinctive present vegetation—inland saltgrass, black greasewood, basin wildrye
Inclusion 3: Position on landscape—slightly concave alluvial flats; contrasting feature—clayey throughout the profile; distinctive present vegetation—black greasewood, alkali sacaton, inland saltgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 12)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess sodium, excess salt
Roadfill: Poor—low strength
Daily cover for landfill: Poor—excess sodium
Shallow excavations: Moderate—wetness
Local roads and streets: Severe—low strength, frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess sodium, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 12.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Ocala	1	2	3
Alkali sacaton	SPAI	5-10	15-30	15-30	5-10
Inland saltgrass	DIST	5-8	5-10	5-10	5-8
Basin wildrye	ELCI2	2-5	40-60	40-60	2-5
Other perennial grasses	PPGG	2-5	2-4	2-4	2-5
Povertyweed	IVAX	---	1-2	1-2	---
Other perennial forbs	PPFF	2-5	2-4	2-4	2-5
Black greasewood	SAVE4	50-60	5-15	5-15	50-60
Shadscale	ATCO	2-5	---	---	2-5
Rubber rabbitbrush	CHNA2	---	2-5	2-5	---
Other shrubs	SSSS	5-10	2-5	2-5	5-10
Range site symbol		028B020N	024X007N	024X007N	028B020N
Potential production (lb/acre):					
Favorable years		600	1,900	1,900	600
Normal years		450	1,400	1,400	450
Unfavorable years		200	800	800	200

Interpretive Groups

Range site symbol: 028B020N

Capability classification: VIIw, nonirrigated

171—Nuc-Maghills association

Map Unit Setting

Positions on landscape: Alluvial fans, fan skirts
Elevation: 6,000 to 7,000 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 90 days

Composition

Nuc gravelly loam, 4 to 8 percent slopes (Durixerollic Calciorthids - loamy-skeletal, carbonatic, frigid)—70 percent
Maghills gravelly sandy loam, 2 to 8 percent slopes (Typic Torriorthents - loamy-skeletal, carbonatic, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Umil loam, 2 to 4 percent slopes (Xerollic Durorthids - loamy, mixed, frigid, shallow)—5 percent
Inclusion 2: Xeric Torriorthents, 4 to 15 percent slopes (Xeric Torriorthents - loamy-skeletal, carbonatic, frigid)—3 percent
Inclusion 3: Lithic Xeric Torriorthents, 4 to 8 percent slopes—2 percent

Nuc Soil

Positions on landscape: Alluvial fans, middle and lower parts of fan skirts
Parent material: Kind—alluvium; source—limestone
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, rabbitbrush, Indian ricegrass
Typical profile:
0 to 4 inches—gravelly loam; 0 to 10 percent cobbles and stones and 30 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, GM; estimated AASHTO classification - A-4
4 to 44 inches—very gravelly loam, very gravelly clay loam, extremely gravelly clay loam; 0 to 10 percent cobbles and stones and 65 to 85 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-4
44 to 60 inches or more—extremely gravelly loamy sand; 0 to 10 percent cobbles and stones and 75 to 90 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GP, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: 60 inches
Hazard of flooding: None
Permeability: In the upper 44 inches—slow; below this depth—rapid
Available water capacity: 3.4 to 4.4 inches
Water supplying capacity: 10 to 11 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.28; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Maghills Soil

Positions on landscape: Convex upper part of alluvial fans, fan skirts
Parent material: Kind—alluvium; source—limestone influenced by volcanic ash
Slope features: Length—short; shape—convex
Dominant present vegetation: Winterfat, shadscale, bud sagebrush, Indian ricegrass, rabbitbrush, bottlebrush squirreltail
Typical profile:
0 to 8 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-2
8 to 17 inches—gravelly sandy loam, gravelly fine sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 40 to 65 percent pebbles (by weight); subangular blocky structure; soft, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM, GM; estimated AASHTO classification—A-1, A-2, A-4
17 to 44 inches—very gravelly sandy loam, very gravelly fine sandy loam, extremely gravelly sandy loam; 0 to 5 percent cobbles and stones and 60 to 80 percent pebbles (by weight); massive; soft, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - GM; estimated AASHTO classification - A-1
44 to 60 inches or more—extremely gravelly loamy sand, extremely gravelly sand; 0 to 5 percent cobbles and stones and 75 to 80 percent pebbles (by weight); single grain; loose; strongly alkaline

(pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - GP, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Frequency—occasional; duration—very brief; months—December through May
Permeability: In the upper 17 inches—moderate; below this depth—moderately rapid
Available water capacity: 3.4 to 4.9 inches
Water supplying capacity: 9 to 10 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.20; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—isolated smooth fan piedmont remnants; contrasting feature—silica-cemented hardpan in the upper 20 inches; distinctive present vegetation—black sagebrush, rabbitbrush, Indian ricegrass
Inclusion 2: Position on landscape—lower side slopes of adjacent mountains; contrasting features—does not have silica cementation, does not flood; distinctive present vegetation—black sagebrush, rabbitbrush, Indian ricegrass
Inclusion 3: Position on landscape—remnants of rock pediments bordering adjacent mountains; contrasting feature—shallow to bedrock; distinctive present vegetation—Utah juniper, Wyoming big sagebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 13)

Elements of Wildlife Habitat

Suitability of Nuc soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Maghills soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Nuc Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—small stones
Gravel: Probable source

Maghills Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—flooding
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: Nuc soil—IIIe, irrigated, and VIIc, nonirrigated; Maghills soil—IIIw, irrigated, and VIIw, nonirrigated
Range site symbol: Nuc soil—028B011N; Maghills soil—028B013N

TABLE 13.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Nuc	Maghills	1	2	3
Indian ricegrass	ORHY	15-25	15-25	15-25	X	15-25
Needleandthread	STCO4	5-10	---	5-10	X	5-10
Bluebunch wheatgrass	AGSP	2-5	---	2-5	X	2-5
Basin wildrye	ELCI2	2-5	---	2-5	X	2-5
Bottlebrush squirreltail	SIHY	---	2-5	---	---	---
Thurber needlegrass	STTH2	---	---	---	X	---
Bluegrass	POA++	---	---	---	X	---
Other perennial grasses	PPGG	10-20	5-10	10-20	X	10-20
Tapertip hawksbeard	CRAC2	---	---	---	X	---
Other perennial forbs	PPFF	5-10	5-10	5-10	X	5-10
Black sagebrush	ARARN	20-30	---	20-30	---	20-30
Bud sagebrush	ARSP5	2-5	---	2-5	---	2-5
Winterfat	EULA5	5-10	30-45	5-10	---	5-10
Small rabbitbrush	CHVIS	2-5	---	2-5	---	2-5
Fourwing saltbush	ATCA2	---	1-2	---	---	---
Wyoming big sagebrush	ARTRW*	---	---	---	X	---
Rabbitbrush	CHRYS9	---	---	---	X	---
Utah juniper	JUOS	---	---	---	X	---
Other shrubs	SSSS	10-20	5-15	10-20	X	10-20
Range site symbol		028B011N	028B013N	028B011N	---	028B011N
Woodland site symbol		---	---	---	025X059N	---
Potential production (lb/acre):						
Favorable years		900	800	900	200	900
Normal years		700	600	700	150	700
Unfavorable years		400	300	400	100	400

172—Nuc-Maghills complex, 2 to 8 percent slopes

Map Unit Setting

Positions on landscape: Alluvial fans, fan skirts
Elevation: 6,000 to 7,000 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 90 days

Composition

Nuc gravelly loam, 4 to 8 percent slopes (Durixerollic Calciorthids - loamy-skeletal, carbonatic, frigid)—70 percent
Maghills gravelly sandy loam, alkaline, rarely flooded, 2 to 8 percent slopes (Typic Torriorthents - loamy-skeletal, carbonatic, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Umil loam, 2 to 4 percent slopes (Xerollic Durorthids - loamy, mixed, frigid, shallow)—5 percent
Inclusion 2: Xeric Torriorthents, 4 to 15 percent slopes (Xeric Torriorthents - loamy-skeletal, carbonatic, frigid)—3 percent
Inclusion 3: Lithic Xeric Torriorthents, 4 to 8 percent slopes—2 percent

Nuc Soil

Positions on landscape: Middle and lower parts of alluvial fans and fan skirts
Parent material: Kind—alluvium; source—limestone
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, rabbitbrush, Indian ricegrass
Typical profile:
0 to 4 inches—gravelly loam; 0 to 10 percent cobbles and stones and 30 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, GM; estimated AASHTO classification - A-4
4 to 44 inches—very gravelly loam, very gravelly clay loam, extremely gravelly clay loam; 0 to 10 percent cobbles and stones and 65 to 85 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-4
44 to 60 inches or more—extremely gravelly loamy sand; 0 to 10 percent cobbles and stones and 75 to 90 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GP, GP-GM; estimated AASHTO classification - A-1

Depth to seasonal high water table: 60 inches
Hazard of flooding: None
Permeability: In the upper 44 inches—slow; below this depth—rapid
Available water capacity: 3.4 to 4.4 inches
Water supplying capacity: 10 to 11 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.28; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Maghills Soil

Positions on landscape: Upper part of alluvial fans and fan skirts
Parent material: Kind—alluvium; source—limestone and dolomite influenced by volcanic ash
Slope features: Length—short; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, Indian ricegrass, needleandthread
Typical profile:
0 to 8 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-2
8 to 17 inches—gravelly sandy loam, gravelly fine sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 40 to 65 percent pebbles (by weight); subangular blocky structure; soft, friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - SM, GM; estimated AASHTO classification - A-1, A-2, A-4
17 to 44 inches—very gravelly sandy loam, very gravelly fine sandy loam, extremely gravelly sandy loam; 0 to 5 percent cobbles and stones and 60 to 80 percent pebbles (by weight); massive; soft, friable; very strongly alkaline (pH 9.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - GM; estimated AASHTO classification - A-1
44 to 60 inches or more—extremely gravelly loamy sand, extremely gravelly sand; 0 to 5 percent cobbles and stones and 75 to 80 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8

mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - GP, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: In the upper 17 inches—moderate; below this depth—moderately rapid
Available water capacity: 3.4 to 4.9 inches
Water supplying capacity: 6 to 8 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.20; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—isolated, smooth fan piedmont remnants; contrasting feature—silica-cemented hardpan in the upper 20 inches; distinctive present vegetation—black sagebrush, rabbitbrush, Indian ricegrass
Inclusion 2: Position on landscape—lower side slopes of adjacent mountains; contrasting features—does not have silica cementation, does not flood; distinctive present vegetation—black sagebrush, rabbitbrush, Indian ricegrass
Inclusion 3: Position on landscape—remnants of rock pediments bordering adjacent mountains; contrasting feature—shallow to bedrock; distinctive present vegetation—Utah juniper, Wyoming big sagebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 14)

Elements of Wildlife Habitat

Suitability of Nuc soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Maghills soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor

Ratings for Selected Uses

Nuc Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—small stones
Gravel: Probable source

Maghills Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—flooding, frost action
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: Nuc soil—VIIc, irrigated, and VIs, nonirrigated; Maghills soil—VIIs, nonirrigated
Range site symbol: Nuc soil—028B011N; Maghills soil—028B017N

TABLE 14.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Nuc	Maghills	1	2	3
Indian ricegrass	ORHY	15-25	5-10	15-25	X	15-25
Needleandthread	STCO4	5-10	5-10	5-10	X	5-10
Bluebunch wheatgrass	AGSP	2-5	---	2-5	X	2-5
Basin wildrye	ELCI2	2-5	---	2-5	X	2-5
Bottlebrush squirreltail	SIHY	---	2-5	---	---	---
Thurber needlegrass	STTH2	---	---	---	X	---
Bluegrass	POA++	---	---	---	X	---
Other perennial grasses	PPGG	10-20	5-10	10-20	X	10-20
Tapertip hawksbeard	CRAC2	---	---	---	X	---
Other perennial forbs	PPFF	5-10	5-10	5-10	X	5-10
Black sagebrush	ARARN	20-30	---	20-30	---	20-30
Bud sagebrush	ARSP5	2-5	5-10	2-5	---	2-5
Winterfat	EULA5	5-10	2-5	5-10	---	5-10
Small rabbitbrush	CHVIS	2-5	---	2-5	---	2-5
Shadscale	ATCO	---	30-40	---	---	---
Fourwing saltbush	ATCA2	---	3-5	---	---	---
Wyoming big sagebrush	ARTRW*	---	---	---	X	---
Rabbitbrush	CHRYS9	---	---	---	X	---
Utah juniper	JUOS	---	---	---	X	---
Other shrubs	SSSS	10-20	5-15	10-20	X	10-20
Range site symbol		028B011N	028B017N	028B011N	---	028B011N
Woodland site symbol		---	---	---	025X059N	---
Potential production (lb/acre):						
Favorable years		900	700	900	200	900
Normal years		700	500	700	150	700
Unfavorable years		400	250	400	100	400

180—Clowfin sandy loam, 0 to 2 percent slopes

Map Unit Setting

Positions on landscape: Smooth fan skirts
Elevation: 5,500 to 6,400 feet
Climatic data (average annual):
Precipitation—about 6 inches
Air temperature—about 47 degrees F
Frost-free season—about 90 days

Composition

Clowfin sandy loam, 0 to 2 percent slopes (Typic Torriorthents - loamy-skeletal, mixed (calcareous), mesic)—95 percent
Contrasting inclusions as follows:
Inclusion 1: Clowfin sandy loam, gullied (Typic Torriorthents - loamy-skeletal, mixed (calcareous), mesic)—2 percent
Inclusion 2: Xerollic Durorthids—2 percent
Inclusion 3: Ricert sandy loam, 0 to 4 percent slopes (Duric Natrargids - fine-loamy, mixed, mesic)—1 percent

Clowfin Soil

Positions on landscape: Fan skirts
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Winterfat, bud sagebrush, low rabbitbrush, Indian ricegrass, shadscale
Typical profile:
0 to 4 inches—sandy loam; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-2
4 to 40 inches—stratified very gravelly sandy loam to very gravelly loam; 10 to 25 percent cobbles and stones and 40 to 60 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2, A-4
40 to 60 inches or more—extremely gravelly sand; 5 to 30 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GP, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Moderately rapid
Available water capacity: 3.2 to 4.6 inches
Water supplying capacity: 4.5 to 7.5 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—3; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—areas near channels; contrasting feature—deep gullies; distinctive present vegetation—Wyoming big sagebrush, basin wildrye, basin big sagebrush
Inclusion 2: Position,on landscape—side slopes of adjacent fan piedmont remnants; contrasting feature—indurated silica-cemented hardpan at a depth of 10 to 40 inches; distinctive present vegetation—black sagebrush, needleandthread, Indian ricegrass
Inclusion 3: Position on landscape—summits of adjacent fan piedmont remnants; contrasting features—salt- and sodium-affected in the middle layer, layer of clay accumulation; distinctive present vegetation—shadscale, bud sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 15)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—flooding
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Moderate—thin layer, seepage, piping
Sand: Probable source

TABLE 15.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Clowfin	1	2	3
Indian ricegrass	ORHY	15-25	2-5	15-25	5-10
Bottlebrush squirreltail	SIHY	2-5	2-5	---	2-5
Basin wildrye	ELCI2	---	10-20	2-5	---
Needleandthread	STCO4	---	2-5	5-10	5-10
Bluebunch wheatgrass	AGSP	---	---	2-5	---
Other perennial grasses	PPGG	5-10	5-10	10-20	5-10
Perennial forbs	PPFF	5-10	5-10	5-10	5-10
Fourwing saltbush	ATCA2	1-2	2-5	---	3-5
Winterfat	EULA5	30-45	---	5-10	2-5
Basin big sagebrush	ARTRT*	---	10-15	---	---
Rabbitbrush	CHRYS9	---	2-5	---	---
Nevada ephedra	EPNE	---	2-5	---	---
Black sagebrush	ARARN	---	---	20-30	---
Bud sagebrush	ARSP5	---	---	2-5	5-10
Small rabbitbrush	CHVIS	---	---	2-5	---
Shadscale	ATCO	---	---	---	30-40
Other shrubs	SSSS	5-15	5-10	10-20	5-15
Range site symbol		028B013N	028B009N	028B011N	028B017N
Potential production (lb/acre):					
Favorable years		800	700	900	700
Normal years		600	400	700	500
Unfavorable years		300	300	400	250

Gravel: Probable source

Interpretive Groups

Capability classification: IIIs, irrigated, and VIIc, nonirrigated
Range site symbol: 028B013N

190—Broyles silt loam, cool, 0 to 2 percent slopes

Map Unit Setting

Positions on landscape: Fan skirts
Elevation: 5,500 to 6,400 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 90 days

Composition

Broyles silt loam, cool, 0 to 2 percent slopes (Duric Camborthids - coarse-loamy, mixed, mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Pumper sandy loam, cool (Typic Camborthids - sandy-skeletal, mixed, mesic)—5 percent
Inclusion 2: Typic Torriorthents—5 percent
Inclusion 3: Typic Camborthids, gullied—5 percent

Broyles Soil

Positions on landscape: Fan skirts
Parent material: Mixed alluvium with a thin loess cap
Slope features: Length—short; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, small rabbitbrush, Nuttall saltbush
Typical profile:
0 to 11 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - ML; estimated AASHTO classification - A-4
11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification - SM; estimated AASHTO classification - A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 6.0 to 7.5 inches
Water supplying capacity: 5 to 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—high
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—slightly convex fan skirts; contrasting feature—uniform sandy texture; distinctive present vegetation—shadscale, bud sagebrush, small rabbitbrush, winterfat, needleandthread
Inclusion 2: Position on landscape—inset fans at outer edges of fan skirts; contrasting feature—does not have silica cementation; distinctive present vegetation—Nuttall saltbush, shadscale, rubber rabbitbrush, globemallow
Inclusion 3: Position on landscape—areas near channels on fan skirts; contrasting feature—does not have silica cementation; distinctive present vegetation—basin big sagebrush, Wyoming big sagebrush, basin wildrye, alkali sacaton

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 16)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Fair—too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—piping, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIs, irrigated, and VIIc, nonirrigated
Range site symbol: 028B017N

TABLE 16.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Broyles	1	2	3
Bottlebrush squirreltail	SIHY	2-5	2-5	5-10	2-5
Needleandthread	STCO4	5-10	5-10	---	2-5
Indian ricegrass	ORHY	5-10	5-15	10-25	2-5
Sand dropseed	SPCR	---	2-5	---	---
Alkali sacaton	SPAI	---	---	T-5	---
Basin wildrye	ELCI2	---	---	---	10-20
Other perennial grasses	PPGG	5-10	5-10	---	5-10
Perennial forbs	PPFF	5-10	5-15	2-4	5-10
Shadscale	ATCO	30-40	---	---	---
Bud sagebrush	ARSP5	5-10	2-5	---	---
Fourwing saltbush	ATCA2	3-5	10-20	---	2-5
Winterfat	EULA5	2-5	10-15	---	---
Ephedra	EPHED	---	2-5	---	---
Nuttall saltbush	ATNU2	---	---	50-60	---
Basin big sagebrush	ARTRT*	---	---	---	10-15
Rabbitbrush	CHRYS9	---	---	---	2-5
Nevada ephedra	EPNE	---	---	---	2-5
Other shrubs	SSSS	5-15	10-15	5-8	5-10
Range site symbol		028B017N	028B014N	024X012N	028B009N
Potential production (lb/acre):					
Favorable years		700	450	700	700
Normal years		500	300	400	400
Unfavorable years		250	125	200	300

191—Broyles-Pumper complex, 0 to 2 percent slopes

Map Unit Setting

Positions on landscape: Fan skirts
Elevation: 5,500 to 6,400 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 49 degrees F
Frost-free season—about 90 days

Composition

Broyles silt loam, cool, 0 to 2 percent slopes (Duric Camborthids - coarse-loamy, mixed, mesic)—60 percent
Pumper sandy loam, cool, 0 to 2 percent slopes (Typic Camborthids - sandy-skeletal, mixed, mesic)—35 percent
Contrasting inclusion as follows:
Inclusion 1: Typic Torriorthents, 0 to 2 percent slopes—5 percent

Broyles Soil

Positions on landscape: Fan skirts
Parent material: Mixed alluvium with a thin loess cap
Slope features: Length—short; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, small rabbitbrush, Nuttall saltbush
Typical profile:
0 to 11 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - ML; estimated AASHTO classification - A-4
11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification - SM; estimated AASHTO classification - A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 6.0 to 7.5 inches
Water supplying capacity: 5 to 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: Low

Pumper Soil

Positions on landscape: Fan skirts
Parent material: Loess with high content of volcanic ash over sandy alluvium
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Shadscale, bud sagebrush, small rabbitbrush, winterfat, needleandthread
Typical profile:
0 to 13 inches—0 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
13 to 60 inches or more—stratified very gravelly sand to extremely gravelly coarse sand; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.7); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - GP; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 13 inches—moderate; below this depth—rapid
Available water capacity: 2.8 to 4.5 inches
Water supplying capacity: 5 to 7 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusion

Inclusion 1: Position on landscape—areas near stream channels on fan skirts; contrasting features—does not have silica cementation, calcareous throughout the profile; distinctive present vegetation—Nuttall saltbush, shadscale, globemallow

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 17)

Elements of Wildlife Habitat

Suitability of Broyles soil for named elements:
- Grain and seed crops (irrigated)—good
- Domestic grasses and legumes (irrigated)—good
- Wild herbaceous plants (nonirrigated)—poor
- Shrubs (nonirrigated)—poor
- Wetland plants—poor
- Shallow water areas—very poor

Suitability of Pumper soil for named elements:
- Grain and seed crops (irrigated)—poor
- Domestic grasses and legumes (irrigated)—poor
- Wild herbaceous plants (nonirrigated)—poor
- Shrubs (nonirrigated)—poor
- Wetland plants—very poor
- Shallow water areas—very poor

Ratings for Selected Uses

Broyles Soil

Suitability and limitations for the following uses:
- *Rangeland seeding:* Poor—too arid
- *Roadfill:* Good
- *Daily cover for landfill:* Fair—too sandy, small stones
- *Shallow excavations:* Severe—cutbanks cave
- *Local roads and streets:* Slight
- *Pond reservoir areas:* Severe—seepage
- *Embankments, dikes, and levees:* Severe—piping, excess salt
- *Sand:* Improbable source—excess fines
- *Gravel:* Improbable source—excess fines

TABLE 17.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		Inclusion number--
		Broyles	Pumper	1
Bottlebrush squirreltail	SIHY	2-5	2-5	5-10
Needleandthread	STCO4	5-10	5-10	---
Indian ricegrass	ORHY	5-10	5-15	10-25
Sand dropseed	SPCR	---	2-5	---
Alkali sacaton	SPAI	---	---	T-5
Other perennial grasses	PPGG	5-10	5-10	---
Perennial forbs	PPFF	5-10	5-15	2-4
Shadscale	ATCO	30-40	---	---
Bud sagebrush	ARSP5	5-10	2-5	---
Fourwing saltbush	ATCA2	3-5	10-20	---
Winterfat	EULA5	2-5	10-15	---
Ephedra	EPHED	---	2-5	---
Nuttall saltbush	ATNU2	---	---	50-60
Other shrubs	SSSS	5-15	10-15	5-8
Range site symbol		028B017N	028B014N	024X012N
Potential production (lb/acre):				
Favorable years		700	450	700
Normal years		500	300	400
Unfavorable years		250	125	200

Pumper Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: Broyles soil—IIs, irrigated, and VIIc, nonirrigated; Pumper soil—IVs, irrigated, and VIIc, nonirrigated
Range site symbol: Broyles soil—028B017N; Pumper soil—028B014N

192—Broyles-Ricert association

Map Unit Setting

Positions on landscape: Fan aprons, fan piedmonts, fan skirts
Elevation: 4,700 to 5,000 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Broyles very fine sandy loam, 2 to 8 percent slopes (Duric Camborthids - coarse-loamy, mixed, mesic)—40 percent
Ricert gravelly silt loam, 2 to 8 percent slopes (Duric Natrargids - fine-loamy, mixed, mesic)—25 percent
Broyles very fine sandy loam, strongly saline, 0 to 2 percent slopes (Duric Camborthids - coarse-loamy, mixed, mesic)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Lithic Haplargids, 8 to 15 percent slopes (Lithic Haplargids - loamy-skeletal, mixed, mesic)—5 percent
Inclusion 2: Durorthidic Torriorthents, 0 to 4 percent slopes (Durorthidic Torriorthents - fine-silty, mixed (calcareous), mesic)—5 percent
Inclusion 3: Ricert gravelly silt loam, 8 to 15 percent slopes (Duric Natrargids - fine-loamy, mixed, mesic)—5 percent

Broyles Soil

Positions on landscape: Fan aprons
Parent material: Mixed alluvium with a thin loess cap
Slope features: Length—short; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, mustard, cheatgrass
Typical profile:
0 to 11 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - ML; estimated AASHTO classification - A-4
11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification - SM; estimated AASHTO classification - A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 6.0 to 7.5 inches
Water supplying capacity: 5 to 8 inches
Runoff: Slow to medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.49; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: Low

Ricert Soil

Positions on landscape: Fan piedmonts
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, mustard, cheatgrass
0 to 5 inches—gravelly silt loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC; estimated AASHTO classification - A-4
5 to 14 inches—loam, clay loam; 0 to 15 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification - CL; estimated AASHTO classification - A-6, A-7
14 to 20 inches—loam, silt loam, clay loam; 0 to 5 percent cobbles and stones and 5 to 20 percent pebbles (by weight); massive; hard, firm; very strongly alkaline (pH 9.2); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CL; estimated AASHTO classification - A-6
20 to 60 inches or more—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly loamy sand; 0 to 15 percent cobbles and stones and 50 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - GM, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 14 inches—moderately slow; below this depth—moderately rapid
Available water capacity: 4.5 to 7.0 inches
Water supplying capacity: 5 to 8 inches
Runoff: Slow to medium
Hydrologic group: B

Erosion factors (upper layer): K value—0.24; T value—3; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: Low

Broyles, Strongly Saline, Soil

Positions on landscape: Fan skirts
Parent material: Mixed alluvium with a thin loess cap
Slope features: Length—short; shape—smooth
Dominant present vegetation: Black greasewood, bud sagebrush, shadscale, mustard, cheatgrass
Typical profile:
0 to 5 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification - ML; estimated AASHTO classification - A-4
5 to 11 inches—silt loam, very fine sandy loam, fine sandy loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 40 to 60); estimated Unified classification - ML, SM; estimated AASHTO classification - A-4
11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification - SM; estimated AASHTO classification - A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 6.0 to 7.5 inches
Water supplying capacity: 5 to 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.49; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—foot slopes of adjacent hills; contrasting features—bedrock at a depth of less than 20 inches, very gravelly throughout the profile; distinctive present vegetation—shadscale, bud sagebrush
Inclusion 2: Position on landscape—lower margins of fan skirts; contrasting feature—silty throughout the profile; distinctive present vegetation—shadscale, bud sagebrush, cheatgrass
Inclusion 3: Position on landscape—higher erosional fan piedmont remnants; contrasting feature—slopes of 8 to 15 percent; distinctive present vegetation—shadscale, bud sagebrush, cheatgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 18)

Elements of Wildlife Habitat

Suitability of Broyles soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Ricert soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Suitability of Broyles, strongly saline, soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor

Ratings for Selected Uses

Broyles Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Fair—too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—piping, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Ricert Soil

Rangeland seeding: Poor—too arid, excess sodium, excess salt
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess sodium
Sand: Probable source
Gravel: Probable source

TABLE 18.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Broyles	Ricert	Broyles, strongly saline	1	2	3
Indian ricegrass	ORHY	5-15	5-15	---	5-15	5-15	5-15
Bottlebrush squirreltail	SIHY	5-10	5-10	7-10	5-10	5-10	5-10
Bluegrass	POA++	2-5	2-5	---	2-5	2-5	2-5
Inland saltgrass	DIST	---	---	T-2	---	---	---
Basin wildrye	ELCI2	---	---	T-2	---	---	---
Globemallow	SPHAE	2-3	2-3	---	2-3	2-3	2-3
Miterwort	NITRO	---	---	2-3	---	---	---
Other perennial forbs	PPFF	2-4	2-4	T-3	2-4	2-4	2-4
Shadscale	ATCO	30-35	30-35	30-40	30-35	30-35	30-35
Bud sagebrush	ARSP5	25-30	25-30	5-10	25-30	25-30	25-30
Black greasewood	SAVE4	---	---	20-30	---	---	---
Seepweed	SUAED	---	---	5-15	---	---	---
Other shrubs	SSSS	2-5	2-5	---	2-5	2-5	2-5
Range site symbol		024X002N	024X002N	024X003N	024X003N	024X002N	024X002N
Potential production (lb/acre):							
Favorable years		700	700	600	700	700	700
Normal years		450	450	450	450	450	450
Unfavorable years		300	300	300	300	300	300

Broyles, Strongly Saline, Soil

Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Good
Daily cover for landfill: Fair—too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—piping, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Broyles soil—IIIe, irrigated, and VIIc, nonirrigated; Ricert soil—IVe, irrigated, and VIIs, nonirrigated; Broyles, strongly saline, soil—IIIs, irrigated, and VIIs, nonirrigated
Range site symbol: Broyles soil—024X002N; Ricert soil—024X002N; Broyles, strongly saline, soil—024X003N

200—Sonoma Variant silt loam

Map Unit Setting

Positions on landscape: Basin floor remnants
Elevation: 5,600 to 5,700 feet
Climatic data (average annual):
Precipitation—about 8 inches
Air temperature—about 47 degrees F
Frost-free season—about 100 days

Composition

Sonoma Variant silt loam, 0 to 2 percent slopes (Typic Fluvaquents - coarse-silty, mixed (calcareous), mesic)—95 percent
Contrasting inclusion as follows:
Inclusion 1: Sonoma silt loam, strongly saline (Aeric Fluvaquents - fine-silty, mixed (calcareous), mesic)—5 percent

Sonoma Variant Soil

Positions on landscape: Basin floor remnants
Parent material: Silty alluvium with some influence of loess and volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Alkali sacaton, alkali muhly, inland saltgrass, alkali bluegrass
Typical profile:
0 to 4 inches—silt loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification - ML; estimated AASHTO classification - A-4
4 to 60 inches—silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification - ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: 6 to 18 inches
Hazard of flooding: Rare
Permeability: Moderate
Available water capacity: 11.0 to 12.5 inches
Water supplying capacity: 14 to 20 inches
Runoff: Very slow
Hydrologic group: D
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: High

Contrasting Inclusion

Inclusion 1: Position on landscape—margins of basin floor remnants; contrasting features—higher percentage of clay throughout the profile, strongly saline in the upper layer; distinctive present vegetation—basin wildrye, alkali sacaton, inland saltgrass

Major Uses

Irrigated cropland, rangeland, wildlife habitat

Potential Native Plant Community (Table 19)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—very poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—good
Shallow water areas—good

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess salt
Roadfill: Poor—wetness
Daily cover for landfill: Poor—wetness
Shallow excavations: Severe—wetness
Local roads and streets: Severe—wetness, frost action
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, wetness
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Vw, irrigated and nonirrigated
Range site symbol: 024X043N

TABLE 19.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	Inclusion number--
		Sonoma Variant	1
Alkali sacaton	SPAI	10-20	15-30
Inland saltgrass	DIST	5-10	5-10
Alkali bluegrass	POJU	30-50	---
Alkali cordgrass	SPGR	2-5	---
Baltic rush	JUBA	5-10	---
Sedge	CAREX	2-5	---
Basin wildrye	ELCI2	---	40-60
Other perennial grasses	PPGG	2-5	2-4
Arrowgrass	TRIGL	2-5	---
Povertyweed	IVAX	---	1-2
Other perennial forbs	PPFF	2-5	2-4
Black greasewood	SAVE4	---	5-15
Rubber rabbitbrush	CHNA2	---	2-5
Other shrubs	SSSS	T-5	2-5
Range site symbol		024X043N	024X007N
Potential production (lb/acre):			
Favorable years		3,000	1,900
Normal years		2,000	1,400
Unfavorable years		1,000	800

201—Umil loam, 2 to 8 percent slopes

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 5,800 to 6,500 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 43 degrees F
Frost-free season—about 90 days

Composition

Umil loam, 2 to 8 percent slopes (Xerollic Durorthids - loamy, mixed, frigid, shallow)—90 percent
Contrasting inclusions as follows:
Inclusion 1: Haploxerollic Durargids, 2 to 4 percent slopes—8 percent
Inclusion 2: Hayeston sandy loam, 2 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—2 percent

Umil Soil

Positions on landscape: Dissected fan piedmonts
Parent material: Mixed alluvium
Slope features: Length—short; shape—smooth
Dominant present vegetation: Black sagebrush, small rabbitbrush, winterfat, bottlebrush squirreltail, Indian ricegrass
Typical profile:
0 to 7 inches—loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML, ML; estimated AASHTO classification - A-4
7 to 12 inches—loam, gravelly loam; 20 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2, A-4
12 to 42 inches or more—indurated hardpan; massive; extremely hard, extremely firm
Range in depth to hardpan: 10 to 14 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderately rapid
Available water capacity: 1.5 to 3.3 inches
Water supplying capacity: 7 to 9 inches
Runoff: Slow to medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.43; T value—1; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—slightly convex areas of fan piedmonts; contrasting feature—layer of clay accumulation over hardpan at a depth of 20 to 40 inches; distinctive present vegetation—Wyoming big sagebrush, bluebunch wheatgrass
Inclusion 2: Position on landscape—inset fans dissecting fan piedmonts; contrasting feature—very deep; distinctive present vegetation—Wyoming big sagebrush, bluebunch wheatgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 20)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty, cemented pan
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Severe—cemented pan
Pond reservoir areas: Severe—seepage, cemented pan
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site symbol: 028B011N

TABLE 20.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Umil	1	2
Indian ricegrass	ORHY	15-25	20-30	20-30
Needleandthread	STCO4	5-10	10-20	10-20
Bluebunch wheatgrass	AGSP	2-5	---	---
Basin wildrye	ELCI2	2-5	---	---
Bottlebrush squirreltail	SIHY	---	5-10	5-10
Sandberg bluegrass	POSE	---	2-5	2-5
Other perennial grasses	PPGG	10-20	5-10	5-10
Perennial forbs	PPFF	5-10	2-5	2-5
Black sagebrush	ARARN	20-30	---	---
Bud sagebrush	ARSP5	2-5	---	---
Winterfat	EULA5	5-10	---	---
Small rabbitbrush	CHVIS	2-5	---	---
Wyoming big sagebrush	ARTRW*	---	15-20	15-20
Other shrubs	SSSS	10-20	5-10	5-10
Range site symbol		028B011N	028B010N	028B010N
Potential production (lb/acre):				
Favorable years		900	800	800
Normal years		700	600	600
Unfavorable years		400	400	400

202—Umil-Hayeston association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 5,800 to 6,500 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Umil loam, 2 to 8 percent slopes (Xerollic Durorthids - loamy, mixed, frigid, shallow)—70 percent
Hayeston sandy loam, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Clowfin sandy loam, 0 to 2 percent slopes (Typic Torriorthents - loamy-skeletal, mixed (calcareous), mesic)—5 percent
Inclusion 2: Haploxerollic Durorthids, 4 to 15 percent slopes—5 percent

Umil Soil

Positions on landscape: Slightly dissected fan piedmonts
Parent material: Mixed alluvium
Slope features: Length—short; shape—smooth
Dominant present vegetation: Black sagebrush, small rabbitbrush, winterfat, bottlebrush squirreltail, Indian ricegrass
Typical profile:
0 to 7 inches—loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML, ML; estimated AASHTO classification - A-4
7 to 12 inches—loam, gravelly loam; 20 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2, A-4
12 to 42 inches or more—indurated hardpan; massive; extremely hard, extremely firm
Range in depth to hardpan: 10 to 14 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderately rapid
Available water capacity: 1.5 to 3.3 inches
Water supplying capacity: 7 to 9 inches
Runoff: Slow to medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.43; T value—1; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Hayeston Soil

Positions on landscape: Inset fans
Parent material: Mixed alluvium
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, basin wildrye, Indian ricegrass
Typical profile:
0 to 4 inches—sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-2, A-4
4 to 27 inches—fine sandy loam, coarse sandy loam, sandy loam; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, SM; estimated AASHTO classification - A-2, A-4
27 to 60 inches or more—stratified very gravelly loamy sand to extremely gravelly sand; 50 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Moderately rapid
Available water capacity: 4 to 6 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow to slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth fan skirts at lower edges of fan piedmonts; contrasting features—very deep, very gravelly throughout the

profile; distinctive present vegetation—winterfat, bud sagebrush, Indian ricegrass

Inclusion 2: Position on landscape—erosional side slopes of fan piedmonts; contrasting feature—hardpan at a depth of 20 to 40 inches; distinctive present vegetation—Utah juniper, big sagebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 21)

TABLE 21.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Umil	Hayeston	1	2
Indian ricegrass	ORHY	15-25	20-30	---	X
Needleandthread	STCO4	5-10	10-20	---	X
Bluebunch wheatgrass	AGSP	2-5	---	10-20	X
Basin wildrye	ELCI2	2-5	---	2-5	X
Bottlebrush squirreltail	SIHY	---	5-10	---	---
Sandberg bluegrass	POSE	---	2-5	---	---
Pine bluegrass	POSC	---	---	2-5	---
Idaho fescue	FEID	---	---	2-5	---
Thurber needlegrass	STTH2	---	---	5-10	X
Western wheatgrass	AGSM	---	---	1-5	---
Bluegrass	POA++	---	---	---	X
Other perennial grasses	PPGG	10-20	5-10	10-20	X
Tapertip hawksbeard	CRAC2	---	---	---	X
Other perennial forbs	PPFF	5-10	2-5	5-12	X
Black sagebrush	ARARN	20-30	---	---	---
Bud sagebrush	ARSP5	2-5	---	---	---
Winterfat	EULA5	5-10	---	---	---
Small rabbitbrush	CHVIS	2-5	---	---	---
Wyoming big sagebrush	ARTRW*	---	15-20	---	X
Serviceberry	AMELA	---	---	2-10	---
Antelope bitterbrush	PUTR2	---	---	5-10	---
Horsebrush	TETRA3	---	---	1-2	---
Mountain big sagebrush	ARTRV	---	---	15-25	---
Rabbitbrush	CHRYS9	---	---	---	X
Utah juniper	JUOS	---	---	---	X
Other shrubs	SSSS	10-20	5-10	5-15	X
Range site symbol		028B011N	028B010N	028B030N	---
Woodland site symbol		---	---	---	025X059N
Potential production (lb/acre):					
Favorable years		900	800	1,100	200
Normal years		700	600	800	150
Unfavorable years		400	400	600	100

Elements of Wildlife Habitat

Suitability of Umil soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Hayeston soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Umil Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty, cemented pan
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Severe—cemented pan
Pond reservoir areas: Severe—seepage, cemented pan
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Hayeston Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—flooding, frost action
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: Umil soil—VIIs, nonirrigated; Hayeston soil—IIIe, irrigated, and VIIc, nonirrigated
Range site symbol: Umil soil—028B011N; Hayeston soil—028B010N

203—Umil-Clowfin association

Map Unit Setting

Positions on landscape: Fan piedmonts, fan skirts
Elevation: 5,800 to 6,500 feet
Climatic data (average annual):
Precipitation—about 8 inches
Air temperature—about 46 degrees F
Frost-free season—about 90 days

Composition

Umil loam, 0 to 4 percent slopes (Xerollic Durorthids - loamy, mixed, frigid, shallow)—70 percent
Clowfin sandy loam, 0 to 4 percent slopes (Typic Torriorthents - loamy-skeletal, mixed (calcareous), mesic)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Lien very gravelly loam, 2 to 4 percent slopes (Xerollic Durorthids - loamy-skeletal, mixed, frigid, shallow)—5 percent
Inclusion 2: Nadra loam, 2 to 4 percent slopes (Entic Durorthids - loamy, mixed, frigid, shallow)—5 percent

Umil Soil

Positions on landscape: Fan piedmonts
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black sagebrush, small rabbitbrush, winterfat, Indian ricegrass
Typical profile:
0 to 7 inches—loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML, ML; estimated AASHTO classification - A-4
7 to 12 inches—; 20 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2, A-4
12 to 42 inches or more—indurated hardpan
Range in depth to hardpan: 10 to 14 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderately rapid
Available water capacity: 1.5 to 1.8 inches
Water supplying capacity: 7 to 9 inches
Runoff: Slow
Hydrologic group: D
Erosion factors (upper layer): K value—43; T value—1; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Clowfin Soil

Positions on landscape: Fan skirts
Parent material: Mixed alluvium
Slope features: Length—short; shape—smooth
Dominant present vegetation: Winterfat, bud sagebrush, globemallow, bottlebrush squirreltail, Indian ricegrass
Typical profile:
0 to 4 inches—sandy loam; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-2
4 to 40 inches—stratified very gravelly sandy loam to very gravelly loam; 10 to 25 percent cobbles and stones and 40 to 60 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2, A-4
40 to 60 inches or more—extremely gravelly sand; 5 to 30 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.8); nonsodic (SAR less than 2); estimated Unified classification - GP, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Moderately rapid
Available water capacity: 3.2 to 4.6 inches
Water supplying capacity: 4.5 to 7.5 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—3; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—partial ballenas adjacent to fan piedmonts; contrasting features—very gravelly, shallow over a hardpan; distinctive present vegetation—singleleaf pinyon, Utah juniper, black sagebrush

Inclusion 2: Position on landscape—slightly convex areas of low fan piedmonts; contrasting features—shallow to a strongly silica-cemented hardpan, lower water supplying capacity; distinctive present vegetation—shadscale, bud sagebrush, bottlebrush squirreltail

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 22)

Elements of Wildlife Habitat

Suitability of Umil soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—poor
Suitability of Clowfin soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor

TABLE 22.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Umil	Clowfin	1	2
Indian ricegrass	ORHY	15-25	15-25	X	5-10
Needleandthread	STCO4	5-10	---	---	5-10
Bluebunch wheatgrass	AGSP	2-5	---	X	---
Basin wildrye	ELCI2	2-5	---	---	---
Bottlebrush squirreltail	SIHY	---	2-5	X	2-5
Pine bluegrass	POSC	---	---	X	---
Thurber needlegrass	STTH2	---	---	X	---
Sandberg bluegrass	POSE	---	---	X	---
Other perennial grasses	PPGG	10-20	5-10	X	5-10
Perennial forbs	PPFF	5-10	5-10	X	5-10
Black sagebrush	ARARN	20-30	---	X	---
Bud sagebrush	ARSP5	2-5	---	---	5-10
Winterfat	EULA5	5-10	30-45	---	2-5
Small rabbitbrush	CHVIS	2-5	---	---	---
Fourwing saltbush	ATCA2	---	1-2	---	3-5
Utah juniper	JUOS	---	---	X	---
Singleleaf pinyon	PIMO	---	---	X	---
Shadscale	ATCO	---	---	---	30-40
Other shrubs	SSSS	10-20	5-15	X	5-15
Range site symbol		028B011N	028B013N	---	028B017N
Woodland site symbol		---	---	025X063N	---
Potential production (lb/acre):					
Favorable years		900	800	400	700
Normal years		700	600	300	500
Unfavorable years		400	300	200	250

Shallow water areas—very poor

Ratings for Selected Uses

Umil Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—cemented pan
Pond reservoir areas: Severe—seepage, cemented pan
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Clowfin Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—flooding
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Moderate—thin layer, seepage, piping
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: Umil soil—VIIs, nonirrigated; Clowfin soil—IIIe, irrigated, and VIIc, nonirrigated
Range site symbol: Umil soil—028B011N; Clowfin soil—028B013N

210—Molion loam, 2 to 8 percent slopes

Map Unit Setting

Positions on landscape: Fan-piedmont remnants
Elevation: 6,000 to 6,800 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 85 days

Composition

Molion loam, 2 to 8 percent slopes (Haploxerollic Durorthids - loamy-skeletal, mixed, frigid, shallow)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Shipley fine sandy loam, 2 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—10 percent
Inclusion 2: Kobeh gravelly loam, 2 to 8 percent slopes (Durixerollic Camborthids - loamy-skeletal, mixed, frigid)—5 percent

Molion Soil

Positions on landscape: Broad fan piedmont remnants
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black sagebrush, small rabbitbrush, winterfat, shadscale, Indian ricegrass, spiny hopsage
Typical profile:
0 to 5 inches—loam; 5 to 15 percent pebbles (by weight); platy structure; soft, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 19 inches—extremely gravelly sandy loam, extremely gravelly loam, very gravelly sandy loam; 65 to 80 percent pebbles (by weight); subangular blocky structure; soft, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, GC-GM; estimated AASHTO classification - A-1, A-2
19 to 33 inches—cemented hardpan
33 to 60 inches or more—stratified very gravelly loamy sand to extremely gravelly loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, GP-GM; estimated AASHTO classification - A-1
Range in depth to hardpan: 14 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 1.5 to 2.0 inches
Water supplying capacity: 7 to 9 inches
Runoff: Slow
Hydrologic group: D
Erosion factors (upper layer): K value—0.32; T value—1; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—lower parts of inset fans; contrasting features—very deep, does not have silica cementation, nongravelly; distinctive present vegetation—winterfat, Indian ricegrass
Inclusion 2: Position on landscape—upper parts of inset fans; contrasting features—very deep, does not have strong silica cementation; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 23)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Good—cemented pan
Daily cover for landfill: Poor—cemented pan, seepage, small stones
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Moderate—cemented pan, frost action
Pond reservoir areas: Severe—cemented pan
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site symbol: 028B011N

TABLE 23.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Molion	1	2
Indian ricegrass	ORHY	15-25	15-25	20-30
Needleandthread	STCO4	5-10	---	10-20
Bluebunch wheatgrass	AGSP	2-5	---	---
Basin wildrye	ELCI2	2-5	---	---
Bottlebrush squirreltail	SIHY	---	2-5	5-10
Sandberg bluegrass	POSE	---	---	2-5
Other perennial grasses	PPGG	10-20	5-10	5-10
Perennial forbs	PPFF	5-10	5-10	2-5
Black sagebrush	ARARN	20-30	---	---
Bud sagebrush	ARSP5	2-5	---	---
Winterfat	EULA5	5-10	30-45	---
Small rabbitbrush	CHVIS	2-5	---	---
Fourwing saltbush	ATCA2	---	1-2	---
Wyoming big sagebrush	ARTRW*	---	---	15-20
Other shrubs	SSSS	10-20	5-15	5-10
Range site symbol		028B011N	028B013N	028B010N
Potential production (lb/acre):				
Favorable years		900	800	800
Normal years		700	600	600
Unfavorable years		400	300	400

211—Molion-Kobeh association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 6,000 to 6,800 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 85 days

Composition

Molion loam, 0 to 2 percent slopes (Haploxerollic Durorthids - loamy-skeletal, mixed, frigid, shallow)—75 percent
Kobeh gravelly loam, 0 to 2 percent slopes (Durixerollic Camborthids - loamy-skeletal, mixed, frigid)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Shipley fine sandy loam, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—5 percent
Inclusion 2: Nadra loam, 0 to 4 percent slopes (Entic Durorthids - loamy, mixed, frigid, shallow)—5 percent

Molion Soil

Positions on landscape: Large, slightly dissected fan piedmonts
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black sagebrush, small rabbitbrush, winterfat, shadscale, Indian ricegrass
Typical profile:
0 to 5 inches—loam; 5 to 15 percent pebbles (by weight); platy structure; soft, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 19 inches—extremely gravelly sandy loam, extremely gravelly loam, very gravelly sandy loam; 65 to 80 percent pebbles (by weight); subangular blocky structure; soft, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC, GM; estimated AASHTO classification - A-1, A-2
19 to 33 inches—cemented hardpan
33 to 60 inches or more—stratified very gravelly loamy sand to extremely gravelly loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, GP-GM; estimated AASHTO classification - A-1
Range in depth to hardpan: 14 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 1.5 to 2.0 inches
Water supplying capacity: 7 to 9 inches
Runoff: Very slow
Hydrologic group: D
Erosion factors (upper layer): K value—0.32; T value—1; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Kobeh Soil

Positions on landscape: Inset fans
Parent material: Mixed alluvium influenced by volcanic ash
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, Indian ricegrass, small rabbitbrush, winterfat
Typical profile:
0 to 7 inches—gravelly loam; 25 to 35 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
7 to 15 inches—gravelly sandy loam, gravelly fine sandy loam; 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-1, A-2
15 to 60 inches or more—stratified gravelly fine sandy loam to very gravelly sand; 50 to 65 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GP-GM, GM, SP-SM, SM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 4.5 to 6.0 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow
Hydrologic group: B

Erosion factors (upper layer): K value—0.24; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—margins of inset fans; contrasting features—nongravelly, does not have silica cementation throughout the profile; distinctive present vegetation—winterfat, Indian ricegrass
Inclusion 2: Position on landscape—slightly convex fan piedmonts; contrasting features—nongravelly throughout the profile, lower water supplying capacity; distinctive present vegetation—shadscale, bud sagebrush, Indian ricegrass, bottlebrush squirreltail

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 24)

Elements of Wildlife Habitat

Suitability of Molion soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Kobeh soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

TABLE 24.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Molion	Kobeh	1	2
Indian ricegrass	ORHY	15-25	20-30	15-25	5-10
Needleandthread	STCO4	5-10	10-20	---	5-10
Bluebunch wheatgrass	AGSP	2-5	---	---	---
Basin wildrye	ELCI2	2-5	---	---	---
Bottlebrush squirreltail	SIHY	---	5-10	2-5	2-5
Sandberg bluegrass	POSE	---	2-5	---	---
Other perennial grasses	PPGG	10-20	5-10	5-10	5-10
Perennial forbs	PPFF	5-10	2-5	5-10	5-10
Black sagebrush	ARARN	20-30	---	---	---
Bud sagebrush	ARSP5	2-5	---	---	5-10
Winterfat	EULA5	5-10	---	30-45	2-5
Small rabbitbrush	CHVIS	2-5	---	---	---
Wyoming big sagebrush	ARTRW*	---	15-20	---	---
Fourwing saltbush	ATCA2	---	---	1-2	3-5
Shadscale	ATCO	---	---	---	30-40
Other shrubs	SSSS	10-20	5-10	5-15	5-15
Range site symbol		028B011N	028B010N	028B013N	028B017N
Potential production (lb/acre):					
Favorable years		900	800	800	700
Normal years		700	600	600	500
Unfavorable years		400	400	300	250

Ratings for Selected Uses

Molion Soil

Suitability and limitations for the following uses:
- *Rangeland seeding:* Poor—droughty
- *Roadfill:* Good—cemented pan
- *Daily cover for landfill:* Poor—cemented pan, seepage, small stones
- *Shallow excavations:* Severe—cemented pan, cutbanks cave
- *Local roads and streets:* Moderate—cemented pan, frost action
- *Pond reservoir areas:* Severe—cemented pan
- *Embankments, dikes, and levees:* Severe—seepage
- *Sand:* Probable source
- *Gravel:* Probable source

Kobeh Soil

Suitability and limitations for the following uses:
- *Rangeland seeding:* Fair—too arid
- *Roadfill:* Good
- *Daily cover for landfill:* Poor—seepage, too sandy, small stones
- *Shallow excavations:* Severe—cutbanks cave
- *Local roads and streets:* Slight
- *Pond reservoir areas:* Severe—seepage
- *Embankments, dikes, and levees:* Severe—seepage
- *Sand:* Probable source
- *Gravel:* Probable source

Interpretive Groups

Capability classification: Molion soil—VIIs, nonirrigated; Kobeh soil—IVs, irrigated, and VIIc, nonirrigated

Range site symbol: Molion soil—028B011N; Kobeh soil—028B010N

221—Hodedo stony loam, 2 to 8 percent slopes

Map Unit Setting

Positions on landscape: Fan-piedmont remnants
Elevation: 6,500 to 7,500 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Hodedo stony loam, 0 to 2 percent slopes (Aridic Durixerolls - fine, montmorillonitic, frigid)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Xeric Torriorthents, 0 to 4 percent slopes—8 percent
Inclusion 2: Haploxerollic Durargids, very shallow, 2 to 8 percent slopes—7 percent

Hodedo Soil

Positions on landscape: Summits of shoulders of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—short; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, Wyoming big sagebrush, pricklypear, Sandberg bluegrass
Typical profile:
0 to 6 inches—stony loam; 15 to 25 percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL; estimated AASHTO classification - A-6
6 to 20 inches—cobbly clay loam, gravelly clay loam, cobbly clay, gravelly clay; 10 to 30 percent cobbles and stones and 5 to 35 percent pebbles (by weight); angular blocky structure; very hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, SM; estimated AASHTO classification - A-1
20 to 29 inches—indurated hardpan
29 to 60 inches or more—extremely cobbly loamy coarse sand; 55 to 65 percent cobbles and stones and 45 to 55 percent pebbles (by weight); massive; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - GM, SM; estimated AASHTO classification - A-1
Range in depth to hardpan: 20 to 26 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—slow
Available water capacity: 2.7 to 3.7 inches
Water supplying capacity: 10 to 11 inches
Runoff: Slow to medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth, concave inset fans; contrasting features—very deep, does not have a hardpan; distinctive present vegetation—big sagebrush, Thurber needlegrass
Inclusion 2: Position on landscape—convex erosional side slopes of fan piedmont remnants; contrasting feature—hardpan at a depth of less than 10 inches; distinctive present vegetation—black sagebrush, winterfat, needleandthread

Major Uses

Rangeland, wildlife habitat, woodland

Potential Native Plant Community (Table 25)

Woodland

Site index for common trees: Singleleaf pinyon—30; Utah juniper—30
Most important native understory plants: Thurber needlegrass, bluebunch wheatgrass, big sagebrush

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty, too arid
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan, large stones
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Moderate—cemented pan, large stones
Pond reservoir areas: Severe—seepage

TABLE 25.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Hodedo	1	2
Indian ricegrass	ORHY	X	5-10	15-25
Needleandthread	STCO4	X	2-5	5-10
Pine bluegrass	POSC	X	2-5	---
Bluebunch wheatgrass	AGSP	X	5-10	2-5
Nevada bluegrass	PONE3	X	---	---
Thurber needlegrass	STTH2	X	20-30	---
Bottlebrush squirreltail	SIHY	X	---	---
Sandberg bluegrass	POSE	X	2-5	---
Western wheatgrass	AGSM	---	1-2	---
Basin wildrye	ELCI2	---	---	2-5
Other perennial grasses	PPGG	X	5-8	10-20
Tapertip hawksbeard	CRAC2	---	2-5	---
Arrowleaf balsamroot	BASA3	---	2-5	---
Lupine	LUPIN	---	2-5	---
White stoneseed	LIRU4	---	1-5	---
Other perennial forbs	PPFF	X	---	5-10
Annual forbs	AAFF	---	2-5	---
Big sagebrush	ARTR2	X	10-15	---
Utah juniper	JUOS	X	---	---
Singleleaf pinyon	PIMO	X	---	---
Rabbitbrush	CHRYS9	---	2-5	---
Antelope bitterbrush	PUTR2	---	1-10	---
Black sagebrush	ARARN	---	---	20-30
Bud sagebrush	ARSP5	---	---	2-5
Winterfat	EULA5	---	---	5-10
Small rabbitbrush	CHVIS	---	---	2-5
Other shrubs	SSSS	X	5-10	10-20
Range site symbol		---	028B007N	028B011N
Woodland site symbol		025X062N	---	---
Potential production (lb/acre):				
Favorable years		500	1,000	900
Normal years		300	800	700
Unfavorable years		250	600	400

Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IVs, irrigated, and VIIs, nonirrigated
Woodland suitability group: 3x

222—Hodedo-Coils association

Map Unit Setting

Positions on landscape: Fan-piedmont remnants
Elevation: 6,200 to 7,000 feet
Climatic data (average annual):
Precipitation—about 11 inches
Air temperature—about 45 degrees F
Frost-free season—about 90 days

Composition

Hodedo stony loam, 8 to 15 percent slopes (Aridic Durixerolls - fine, montmorillonitic, frigid)—60 percent
Coils loam, 2 to 15 percent slopes (Haploxerollic Durargids - fine, montmorillonitic, frigid)—25 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Camborthids, 0 to 4 percent slopes—5 percent
Inclusion 2: Haploxerollic Durorthids, 2 to 15 percent slopes—5 percent
Inclusion 3: Xerollic Durorthids, 2 to 15 percent slopes—5 percent

Hodedo Soil

Positions on landscape: Summits of upper part of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—short; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, Wyoming big sagebrush, Indian ricegrass
Typical profile:
0 to 6 inches—stony loam; 15 to 25 percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL; estimated AASHTO classification - A-6
6 to 20 inches—cobbly clay loam, gravelly clay loam, cobbly clay, gravelly clay; 10 to 30 percent cobbles and stones and 15 to 35 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SC, CL; estimated AASHTO classification - A-7
20 to 29 inches—indurated hardpan
29 to 60 inches or more—extremely cobbly loamy coarse sand; 55 to 65 percent cobbles and stones and 45 to 55 percent pebbles (by weight); massive; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - GM, SM; estimated AASHTO classification - A-1
Range in depth to hardpan: 20 to 26 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—slow
Available water capacity: 2.7 to 3.7 inches
Water supplying capacity: 10 to 11 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Coils Soil

Positions on landscape: Summits and side slopes of lower part of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Wyoming big sagebrush, small rabbitbrush, Indian ricegrass, bottlebrush squirreltail
Typical profile:
0 to 5 inches—loam; 0 to 5 percent cobbles and stones and 0 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL, CL-ML; estimated AASHTO classification - A-4, A-6
5 to 26 inches—clay loam, gravelly clay loam clay, gravelly clay; 10 to 30 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
26 to 37 inches—cemented hardpan
37 to 60 inches or more—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); massive; hard, very firm; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2
Range in depth to hardpan: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the cemented hardpan—slow
Available water capacity: 3.2 to 5.0 inches

Water supplying capacity: 9 to 11 inches
Runoff: Slow to medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.37; T value—2; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans; contrasting feature—does not have a silica-cemented hardpan, clay increase in middle layer; distinctive present vegetation—Wyoming big sagebrush, small rabbitbrush, Indian ricegrass, bottlebrush squirreltail
Inclusion 2: Position on landscape—concave side slopes of fan piedmont remnants; contrasting feature—does not have a clay increase in middle layer; distinctive present vegetation—Utah juniper, big sagebrush
Inclusion 3: Position on landscape—slightly convex side slopes of fan piedmont remnants; contrasting feature—does not have a clay increase in middle layer; distinctive present vegetation—Wyoming big sagebrush, small rabbitbrush, Indian ricegrass, bottlebrush squirreltail

Major Uses

Rangeland, wildlife habitat, woodland

Potential Native Plant Community (Table 26)

Woodland

Hodedo Soil

Site index for common trees: Singleleaf pinyon—30; Utah juniper—30
Most important native understory plants: Thurber needlegrass, bluebunch wheatgrass, big sagebrush

Elements of Wildlife Habitat

Suitability of Hodedo soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—fair
Suitability of Coils soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Hodedo Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty, too arid
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan, large stones
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Moderate—cemented pan, large stones
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Coils Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty, too arid
Roadfill: Good
Daily cover for landfill: Poor—cemented pan, small stones
Shallow excavations: Moderate—cemented pan, too clayey, slope
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Hodedo soil—IVs, irrigated, and VIIs, nonirrigated; Coils soil—IVe, irrigated, and VIs, nonirrigated
Woodland suitability group: Hodedo soil—3x
Range site symbol: Coils soil—028B007N

TABLE 26.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Hodedo	Coils	1	2	3
Indian ricegrass	ORHY	X	5-10	5-10	X	5-10
Needleandthread	STCO4	X	2-5	2-5	X	2-5
Pine bluegrass	POSC	X	2-5	2-5	X	2-5
Bluebunch wheatgrass	AGSP	X	5-10	5-10	X	5-10
Nevada bluegrass	PONE3	X	---	---	X	---
Thurber needlegrass	STTH2	X	20-30	20-30	X	20-30
Bottlebrush squirreltail	SIHY	X	---	---	X	---
Sandberg bluegrass	POSE	X	2-5	2-5	X	2-5
Western wheatgrass	AGSM	---	1-2	1-2	---	1-2
Other perennial grasses	PPGG	X	5-8	5-8	X	5-8
Tapertip hawksbeard	CRAC2	---	2-5	2-5	---	2-5
Arrowleaf balsamroot	BASA3	---	2-5	2-5	---	2-5
Lupine	LUPIN	---	2-5	2-5	---	2-5
White stoneseed	LIRU4	---	1-5	1-5	---	1-5
Other perennial forbs	PPFF	X	---	---	X	---
Annual forbs	AAFF	---	2-5	2-5	---	2-5
Big sagebrush	ARTR2	X	10-15	10-15	X	10-15
Utah juniper	JUOS	X	---	---	X	---
Singleleaf pinyon	PIMO	X	---	---	X	---
Rabbitbrush	CHRYS9	---	2-5	2-5	---	2-5
Antelope bitterbrush	PUTR2	---	1-10	1-10	---	1-10
Other shrubs	SSSS	X	5-10	5-10	X	5-10
Range site symbol		---	028B007N	028B007N	---	028B007N
Woodland site symbol		025X062N	---	---	025X062N	---
Potential production (lb/acre):						
Favorable years		500	1,000	1,000	500	1,000
Normal years		300	800	800	300	800
Unfavorable years		250	600	600	250	600

223—Hodedo very stony loam, 15 to 30 percent slopes

Map Unit Setting

Positions on landscape: Fan-piedmont remnants
Elevation: 6,800 to 7,500 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Hodedo very stony loam, 15 to 30 percent slopes (Aridic Durixerolls - fine, montmorillonitic, frigid)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Durargids, 2 to 8 percent slopes—10 percent
Inclusion 2: Haploxerollic Durargids, 8 to 30 percent slopes—3 percent
Inclusion 3: Aridic Haploxerolls, 4 to 15 percent slopes—2 percent

Hodedo Soil

Positions on landscape: Summits and shoulders of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—short; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, Indian ricegrass, small rabbitbrush
Typical profile:
0 to 6 inches—very stony loam; 25 to 40 percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL; estimated AASHTO classification - A-6
6 to 20 inches—cobbly clay loam, gravelly clay loam, cobbly clay, gravelly clay; 10 to 30 percent cobbles and stones and 15 to 35 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SC, CL; estimated AASHTO classification - A-7
20 to 29 inches—indurated hardpan
29 to 60 inches or more—extremely cobbly loamy coarse sand; 55 to 65 percent cobbles and stones and 45 to 55 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 7.9); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - GM, SM; estimated AASHTO classification - A-1
Range in depth to hardpan: 20 to 26 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—slow
Available water capacity: 2.7 to 3.7 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth shoulders of fan-piedmont remnants; contrasting feature—thin upper layer; distinctive present vegetation—singleleaf pinyon, Utah juniper, big sagebrush
Inclusion 2: Position on landscape—side slopes of fan piedmont remnants; contrasting feature—thin, eroded upper layer; distinctive present vegetation—Utah juniper, big sagebrush
Inclusion 3: Position on landscape—inset fans; contrasting feature—does not have a clay increase in middle layer, very deep; distinctive present vegetation—big sagebrush, needleandthread

Major Uses

Rangeland, wildlife habitat, woodland

Potential Native Plant Community (Table 27)

Woodland

Site index for common trees: Singleleaf pinyon—30; Utah juniper—30
Most important native understory plants: Thurber needlegrass, bluebunch wheatgrass, big sagebrush

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty, too arid, large stones
Roadfill: Poor—cemented pan

Daily cover for landfill: Poor—cemented pan, large stones, slope
Shallow excavations: Severe—cemented pan, cutbanks cave, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIs, nonirrigated
Woodland suitability group: 3x

TABLE 27.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Hodedo	1	2	3
Indian ricegrass	ORHY	X	X	5-10	X
Needleandthread	STCO4	X	X	2-5	X
Pine bluegrass	POSC	X	---	2-5	X
Bluebunch wheatgrass	AGSP	X	X	5-10	X
Nevada bluegrass	PONE3	X	---	---	X
Thurber needlegrass	STTH2	X	X	20-30	X
Bottlebrush squirreltail	SIHY	X	---	---	X
Sandberg bluegrass	POSE	X	---	2-5	X
Basin wildrye	ELCI2	---	X	---	---
Bluegrass	POA++	---	X	---	---
Western wheatgrass	AGSM	---	---	1-2	---
Other perennial grasses	PPGG	X	X	5-8	X
Tapertip hawksbeard	CRAC2	---	X	2-5	---
Arrowleaf balsamroot	BASA3	---	---	2-5	---
Lupine	LUPIN	---	---	2-5	---
White stoneseed	LIRU4	---	---	1-5	---
Other perennial forbs	PPFF	X	X	---	X
Annual forbs	AAFF	---	---	2-5	---
Big sagebrush	ARTR2	X	---	10-15	X
Utah juniper	JUOS	X	X	---	X
Singleleaf pinyon	PIMO	X	---	---	X
Wyoming big sagebrush	ARTRW*	---	X	---	---
Rabbitbrush	CHRYS9	---	X	2-5	---
Antelope bitterbrush	PUTR2	---	---	1-10	---
Other shrubs	SSSS	X	X	5-10	X
Range site symbol		---	---	028B007N	---
Woodland site symbol		025X062N	025X059N	---	025X062N
Potential production (lb/acre):					
Favorable years		500	200	1,000	500
Normal years		300	150	800	300
Unfavorable years		250	100	600	250

230—Nadra loam, 0 to 4 percent slopes

Map Unit Setting

Positions on landscape: Fan-piedmont remnants
Elevation: 6,000 to 7,000 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 45 degrees F
Frost-free season—about 80 days

Composition

Nadra loam, 0 to 4 percent slopes (Entic Durorthids - loamy, mixed, frigid, shallow)—95 percent
Contrasting inclusion as follows:
Inclusion 1: Shipley fine sandy loam, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—5 percent

Nadra Soil

Positions on landscape: Fan-piedmont remnants
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, small rabbitbrush, Indian ricegrass, winterfat
Typical profile:
0 to 7 inches—loam; 0 to 20 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4
7 to 19 inches—sandy loam, gravelly loam, fine sandy loam; 15 to 45 percent pebbles (by weight); subangular blocky structure; soft, friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - SM, GM; estimated AASHTO classification - A-2, A-4

TABLE 28.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	Inclusion number--
		Nadra	1
Bottlebrush squirreltail	SIHY	2-5	2-5
Needleandthread	STCO4	5-10	---
Indian ricegrass	ORHY	5-10	15-25
Other perennial grasses	PPGG	5-10	5-10
Perennial forbs	PPFF	5-10	5-10
Shadscale	ATCO	30-40	---
Bud sagebrush	ARSP5	5-10	---
Fourwing saltbush	ATCA2	3-5	1-2
Winterfat	EULA5	2-5	30-45
Other shrubs	SSSS	5-15	5-15
Range site symbol		028B017N	028B013N
Potential production (lb/acre):			
Favorable years		700	800
Normal years		500	600
Unfavorable years		250	300

19 to 33 inches—cemented hardpan
33 to 60 inches or more—extremely gravelly loamy sand; 75 to 80 percent pebbles (by weight); massive; hard, firm; very strongly alkaline (pH 9.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - GP-GM; estimated AASHTO classification - A-1

Range in depth to hardpan: 14 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 2.0 to 3.5 inches
Water supplying capacity: 4 to 6 inches
Runoff: Slow
Hydrologic group: D
Erosion factors (upper layer): K value—0.37; T value—1; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusion

Inclusion 1: Position on landscape—inset fans dissecting fan piedmonts; contrasting feature—does not have a silica-cemented hardpan; distinctive present vegetation—winterfat, Indian ricegrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 28)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, cemented pan
Roadfill: Good
Daily cover for landfill: Poor—cemented pan, seepage, small stones
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Moderate—cemented pan, frost action
Pond reservoir areas: Severe—cemented pan, seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Probable source

Interpretive Groups

Capability classification: IVe, irrigated, and VIIs, nonirrigated
Range site symbol: 028B017N

241—Humboldt loam, drained, slightly saline, rarely flooded

Map Unit Setting

Positions on landscape: Flood plains
Elevation: 5,100 to 5,500 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 49 degrees F
Frost-free season—about 100 days

Composition

Humboldt loam, drained, slightly saline, rarely flooded, 0 to 2 percent slopes (Fluvaquentic Haplaquolls - fine, montmorillonitic (calcareous), mesic)—95 percent
Contrasting inclusions as follows:
Inclusion 1: Durorthidic Torriorthents, 0 to 2 percent slopes (Durorthidic Torriorthents - fine-silty, mixed (calcareous), mesic)—3 percent
Inclusion 2: Aeric Halaquepts, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—2 percent

Humboldt Soil

Positions on landscape: Flood plains
Parent material: Silty alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Basin wildrye, creeping wildrye, alkali bluegrass, inland saltgrass, rush
Typical profile:
0 to 13 inches—loam; prismatic structure; hard, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL; estimated AASHTO classification - A-6
13 to 60 inches or more—stratified silty clay loam to clay; massive; hard, friable; very strongly alkaline (pH 9.1); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - MH, CH; estimated AASHTO classification - A-7
Depth to water table (artificially lowered): More than 60 inches
Hazard of flooding: Rare
Permeability: Moderately slow
Available water capacity: 10 to 12 inches
Water supplying capacity: 7 to 10 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.32; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—stream terraces; contrasting features—less than 35 percent clay throughout the profile, weak silica cementation, moderately well drained; distinctive present vegetation—black greasewood, shadscale
Inclusion 2: Position on landscape—alluvial flats, areas adjacent to margins of the flood plains; contrasting features—less than 35 percent clay throughout the profile, strongly saline; distinctive present vegetation—basin wildrye, basin big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 29)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess salt
Roadfill: Poor—low strength
Daily cover for landfill: Poor—too clayey, hard to pack
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—hard to pack, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIs, irrigated, and VIIs, nonirrigated
Range site symbol: 025X001N

TABLE 29.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Humboldt	1	2
Basin wildrye	ELCI2	15-30	T-2	50-60
Inland saltgrass	DIST	5-10	T-2	2-5
Creeping wildrye	ELTR3	15-30	---	---
Nevada bluegrass	PONE3	5-10	---	---
Mat muhly	MURI	5-10	---	2-5
Bottlebrush squirreltail	SIHY	---	7-10	2-5
Western wheatgrass	AGSM	---	---	5-10
Other perennial grasses	PPGG	5-15	---	2-5
Miterwort	NITRO	---	2-3	---
Povertyweed	IVAX	---	---	1-2
Other perennial forbs	PPFF	5-10	T-3	2-3
Basin big sagebrush	ARTRT*	2-3	---	15-20
Willow	SALIX	5-10	---	---
Shadscale	ATCO	---	30-40	---
Bud sagebrush	ARSP5	---	5-10	---
Black greasewood	SAVE4	---	20-30	2-5
Seepweed	SUAED	---	5-15	---
Rubber rabbitbrush	CHNA2	---	---	2-5
Other shrubs	SSSS	2-5	---	2-4
Range site symbol		025X001N	024X003N	024X006N
Potential production (lb/acre):				
Favorable years		3,000	600	1,500
Normal years		2,500	450	1,100
Unfavorable years		1,800	300	600

250—Dianev silt loam, occasionally flooded

Map Unit Setting

Positions on landscape: Flood plains
Elevation: 6,000 to 7,000 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 44 degrees F
Frost-free season—about 70 days

Composition

Dianev silt loam, occasionally flooded, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), frigid)—90 percent
Contrasting inclusions as follows:
Inclusion 1: Haplaquolls—5 percent
Inclusion 2: Bubus loam, 0 to 4 percent slopes (Durorthidic Torriorthents - coarse-loamy, mixed (calcareous), mesic)—5 percent

Dianev Soil

Positions on landscape: Flood plains
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, rabbitbrush, alkali sacaton, basin wildrye
Typical profile:
0 to 5 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 40); estimated Unified classification - CL-ML, ML; estimated AASHTO classification - A-4
5 to 57 inches—silty clay loam, silt loam; massive; hard, friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 40); estimated Unified classification - CL; estimated AASHTO classification - A-6, A-7
Depth to seasonal high water table: 30 to 48 inches
Hazard of flooding: Frequency—occasional; duration—brief; months—December through March
Permeability: Slow
Available water capacity: 10 to 12 inches
Water supplying capacity: 9 to 10 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.64; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—shallow swales on flood plains; contrasting feature—thick, dark-colored upper layer; distinctive present vegetation—alkali sacaton, alkali muhly, alkali cordgrass
Inclusion 2: Position on landscape—stream terraces; contrasting feature—moderately coarse textured throughout the profile; distinctive present vegetation—shadscale, bud sagebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 30)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—fair
Shallow water areas—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess salt, excess sodium
Roadfill: Fair—shrink-swell
Daily cover for landfill: Poor—excess sodium
Shallow excavations: Moderate—wetness, flooding
Local roads and streets: Severe—low strength, flooding, frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess sodium
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIIw, irrigated, and VIIw, nonirrigated
Range site symbol: 028B004N

TABLE 30.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Dianev	1	2
Inland saltgrass	DIST	5-10	---	T-2
Basin wildrye	ELCI2	5-15	---	T-2
Alkali sacaton	SPAI	20-30	30-40	---
Alkali cordgrass	SPGR	---	5-10	---
Alkali muhly	MUAS	---	5-15	---
Bottlebrush squirreltail	SIHY	---	---	7-10
Other perennial grasses	PPGG	10-20	10-15	---
Miterwort	NITRO	---	---	2-3
Other perennial forbs	PPFF	5-10	5-10	T-3
Basin big sagebrush	ARTRT*	2-5	---	---
Black greasewood	SAVE4	5-10	---	20-30
Fourwing saltbush	ATCA2	2-5	---	---
Rubber rabbitbrush	CHNA2	2-5	---	---
Shadscale	ATCO	---	---	30-40
Bud sagebrush	ARSP5	---	---	5-10
Seepweed	SUAED	---	---	5-15
Other shrubs	SSSS	2-5	5-10	---
Range site symbol		028B004N	028B002N	024X003N
Potential production (lb/acre):				
Favorable years		2,000	3,000	600
Normal years		1,000	1,500	450
Unfavorable years		500	700	300

260—Shipley fine sandy loam, occasionally flooded, 0 to 4 percent slopes

Map Unit Setting

Positions on landscape: Inset fans, fan skirts
Elevation: 6,200 to 7,200 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Shipley fine sandy loam, occasionally flooded, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—90 percent
Contrasting inclusions as follows:
Inclusion 1: Xeric Torriorthents, 0 to 4 percent slopes (Xeric Torriorthents - loamy-skeletal, mixed (calcareous), frigid)—5 percent
Inclusion 2: Durixerollic Calciorthids, 0 to 4 percent slopes—5 percent

Shipley Soil

Positions on landscape: Inset fans, fan skirts
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Winterfat, bud sagebrush, small rabbitbrush, Indian ricegrass
Typical profile:
0 to 9 inches—fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
9 to 41 inches—fine sandy loam, sandy loam; 0 to 10 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - SM; estimated AASHTO classification - A-2
41 to 60 inches or more—stratified gravelly loam to very gravelly sandy loam; 35 to 60 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - GM, SM; estimated AASHTO classification - A-1, A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Frequency—occasional; duration—very brief; months—February through July
Permeability: Moderate
Available water capacity: 6.5 to 8.0 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.37; T value—3; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—areas adjacent to narrow drainageways on inset fans and fan skirts; contrasting feature—very gravelly throughout the profile; distinctive present vegetation—Wyoming big sagebrush, rabbitbrush, Indian ricegrass, needleandthread
Inclusion 2: Position on landscape—fan remnants on the upper part of fan skirts; contrasting feature—layers of lime accumulation and silica cementation; distinctive present vegetation—black sagebrush, small rabbitbrush, winterfat

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 31)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—thin layer
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIIw, irrigated, and VIw, nonirrigated
Range site symbol: 028B013N

TABLE 31.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Shipley	1	2
Indian ricegrass	ORHY	15-25	20-30	15-25
Bottlebrush squirreltail	SIHY	2-5	5-10	---
Needleandthread	STCO4	---	10-20	5-10
Sandberg bluegrass	POSE	---	2-5	---
Bluebunch wheatgrass	AGSP	---	---	2-5
Basin wildrye	ELCI2	---	---	2-5
Other perennial grasses	PPGG	5-10	5-10	10-20
Perennial forbs	PPFF	5-10	2-5	5-10
Fourwing saltbush	ATCA2	1-2	---	---
Winterfat	EULA5	30-45	---	5-10
Wyoming big sagebrush	ARTRW*	---	15-20	---
Black sagebrush	ARARN	---	---	20-30
Bud sagebrush	ARSP5	---	---	2-5
Small rabbitbrush	CHVIS	---	---	2-5
Other shrubs	SSSS	5-15	5-10	10-20
Range site symbol		028B013N	028B010N	028B011N
Potential production (lb/acre):				
Favorable years		800	800	900
Normal years		600	600	700
Unfavorable years		300	400	400

270—Poorcal loam, 0 to 4 percent slopes

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 6,200 to 7,000 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 80 days

Composition

Poorcal loam, 0 to 4 percent slopes (Durixerollic Calciorthids - coarse-loamy, mixed, frigid)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Hayeston sandy loam, 0 to 2 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—5 percent
Inclusion 2: Durorthidic Torriorthents loam, 0 to 4 percent slopes (Durorthidic Torriorthents - coarse-loamy, mixed (calcareous), frigid)—5 percent
Inclusion 3: Nadra loam, 0 to 4 percent slopes (Entic Durorthids - loamy, mixed, frigid, shallow)—5 percent

Poorcal Soil

Positions on landscape: Remnants of inset fans
Parent material: Kind—alluvium; source—calcareous rock influenced by loess and volcanic ash
Slope features: Length—short; shape—slightly concave
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, Indian ricegrass, needleandthread
Typical profile:
0 to 5 inches—loam; 0 to 10 percent pebbles (by weight); granular structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 29 inches—gravelly sandy loam, loam, gravelly loam; 15 to 45 percent pebbles (by weight); subangular blocky structure; soft, friable; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2, A-4
29 to 60 inches or more—very gravelly loamy sand, very gravelly sandy loam, very gravelly loam; 50 to 60 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2

Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 29 inches—moderate; below this depth—moderately rapid
Available water capacity: 4.5 to 6.0 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.32; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—margins of inset fans; contrasting feature—does not have silica cementation or a layer of lime accumulation; distinctive present vegetation—Wyoming big sagebrush, rabbitbrush, Indian ricegrass, needleandthread
Inclusion 2: Position on landscape—stream terraces adjacent to channels; contrasting features—saline-alkali affected, does not have a layer of lime accumulation; distinctive present vegetation—black greasewood, shadscale, bud sagebrush
Inclusion 3: Position on landscape—adjacent smooth stream terraces; contrasting feature—silica-cemented hardpan at a depth of less than 20 inches; distinctive present vegetation—shadscale, bud sagebrush, Indian ricegrass

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 32)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave

TABLE 32.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Poorcal	1	2	3
Indian ricegrass	ORHY	20-30	20-30	---	5-10
Needleandthread	STCO4	10-20	10-20	---	5-10
Bottlebrush squirreltail	SIHY	5-10	5-10	7-10	2-5
Sandberg bluegrass	POSE	2-5	2-5	---	---
Inland saltgrass	DIST	---	---	T-2	---
Basin wildrye	ELCI2	---	---	T-2	---
Other perennial grasses	PPGG	5-10	5-10	---	5-10
Miterwort	NITRO	---	---	2-3	---
Other perennial forbs	PPFF	2-5	2-5	T-3	5-10
Wyoming big sagebrush	ARTRW*	15-20	15-20	---	---
Shadscale	ATCO	---	---	30-40	30-40
Bud sagebrush	ARSP5	---	---	5-10	5-10
Black greasewood	SAVE4	---	---	20-30	---
Seepweed	SUAED	---	---	5-15	---
Fourwing saltbush	ATCA2	---	---	---	3-5
Winterfat	EULA5	---	---	---	2-5
Other shrubs	SSSS	5-10	5-10	---	5-15
Range site symbol		028B010N	028B010N	024X003N	028B017N
Potential production (lb/acre):					
Favorable years		800	800	600	700
Normal years		600	600	450	500
Unfavorable years		400	400	300	250

Local roads and streets: Moderate—frost action
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IVe, irrigated, and VIIc, nonirrigated
Range site symbol: 028B010N

271—Poorcal-Lopwash association

Map Unit Setting

Positions on landscape: Fan skirts, associated inset fans
Elevation: 6,200 to 6,800 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 80 days

Composition

Poorcal loam, 0 to 4 percent slopes (Durixerollic Calciorthids - coarse-loamy, mixed, frigid)—55 percent
Lopwash loam, 0 to 4 percent slopes (Typic Camborthids - loamy-skeletal, mixed, frigid)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Durorthidic Torriorthents loam, 0 to 4 percent slopes (Durorthidic Torriorthents - coarse-loamy, mixed (calcareous), frigid)—2 percent
Inclusion 2: Pedoli loam, 0 to 4 percent slopes (Xerollic Haplargids - fine-loamy, mixed, frigid)—2 percent
Inclusion 3: Shipley fine sandy loam, occasionally flooded, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—1 percent

Poorcal Soil

Positions on landscape: Wide inset fans
Parent material: Kind—alluvium; source—calcareous rock influenced by loess and volcanic ash
Slope features: Length—short; shape—slightly concave
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, Indian ricegrass, needleandthread
Typical profile:
0 to 5 inches—loam; 0 to 10 percent pebbles (by weight); granular structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 29 inches—gravelly sandy loam, loam, gravelly loam; 15 to 45 percent pebbles (by weight); subangular blocky structure; soft, friable; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2, A-4
29 to 60 inches or more—very gravelly loamy sand, very gravelly sandy loam, very gravelly loam; 50 to 60 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 29 inches—moderate; below this depth—moderately rapid
Available water capacity: 4.5 to 6.0 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.32; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Lopwash Soil

Positions on landscape: Fan skirts
Parent material: Mixed alluvium
Slope features: Length—short; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, Indian ricegrass
Typical profile:
0 to 10 inches—loam; 10 to 20 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
10 to 32 inches—very gravelly coarse sandy loam; 60 to 70 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - GM-GC; estimated AASHTO classification - A-1
32 to 60 inches or more—very gravelly loamy sand; 0 to 5 percent cobbles and stones and 55 to 70 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - GP-GM, GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 4 to 6 inches
Water supplying capacity: 5 to 8 inches
Runoff: Slow
Hydrologic group: B

Erosion factors (upper layer): K value—0.37; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—stream terraces adjacent to channels; contrasting feature—saline-alkali affected; distinctive present vegetation—shadscale, greasewood
Inclusion 2: Position on landscape—nonburied fan piedmont remnants; contrasting feature—moderately fine textured middle layer; distinctive present vegetation—Wyoming big sagebrush, rabbitbrush, Indian ricegrass, needleandthread
Inclusion 3: Position on landscape—smooth, narrow inset fans; contrasting feature—occasionally flooded; distinctive present vegetation—winterfat, bottlebrush squirreltail, small rabbitbrush

Major Uses

Current uses: Rangeland wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 33)

TABLE 33.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T' means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Poorcal	Lopwash	1	2	3
Indian ricegrass	ORHY	20-30	5-10	---	20-30	15-25
Needleandthread	STCO4	10-20	5-10	---	10-20	---
Bottlebrush squirreltail	SIHY	5-10	2-5	7-10	5-10	2-5
Sandberg bluegrass	POSE	2-5	---	---	2-5	---
Inland saltgrass	DIST	---	---	T-2	---	---
Basin wildrye	ELCI2	---	---	T-2	---	---
Other perennial grasses	PPGG	5-10	5-10	---	5-10	5-10
Miterwort	NITRO	---	---	2-3	---	---
Other perennial forbs	PPFF	2-5	5-10	T-3	2-5	5-10
Wyoming big sagebrush	ARTRW*	15-20	---	---	15-20	---
Shadscale	ATCO	---	30-40	30-40	---	---
Bud sagebrush	ARSP5	---	5-10	5-10	---	---
Fourwing saltbush	ATCA2	---	3-5	---	---	1-2
Winterfat	EULA5	---	2-5	---	---	30-45
Black greasewood	SAVE4	---	---	20-30	---	---
Seepweed	SUAED	---	---	5-15	---	---
Other shrubs	SSSS	5-10	5-15	---	5-10	5-15

Range site symbol	028B010N	028B017N	024X003N	028B010N	028B013N
Potential production (lb/acre):					
Favorable years	800	700	600	800	800
Normal years	600	500	450	600	600
Unfavorable years	400	250	300	400	300

Elements of Wildlife Habitat

Suitability of Poorcal soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor
Suitability of Lopwash soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Poorcal Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Lopwash Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: IVe, irrigated, and VIIc, nonirrigated
Range site symbol: Poorcal soil—028B010N; Lopwash soil—028B017N

280—Coils loam, 2 to 8 percent slopes

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 6,200 to 7,000 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 90 days

Composition

Coils loam, 2 to 8 percent slopes (Haploxerollic Durargids - fine, montmorillonitic, frigid)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Aridic Haploxerolls, 0 to 8 percent slopes—5 percent
Inclusion 2: Haploxerollic Durorthids, shallow, 0 to 8 percent slopes—5 percent
Inclusion 3: Pedoli loam, 2 to 8 percent slopes (Xerollic Haplargids - fine-loamy, mixed, frigid)—5 percent

Coils Soil

Positions on landscape: Summits of fan piedmonts
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Big sagebrush, Thurber needlegrass, Indian ricegrass, pine bluegrass
Typical profile:
0 to 5 inches—loam; 0 to 5 percent cobbles and stones and 0 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CL-ML; estimated AASHTO classification - A-4, A-6
5 to 26 inches—clay loam, gravelly clay loam, gravelly clay; 10 to 30 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
26 to 37 inches—cemented hardpan
37 to 60 inches or more—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); massive; hard, very firm; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification GM, GM-GC; estimated AASHTO classification - A-1, A-2
Range in depth to hardpan: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—slow
Available water capacity: 3.3 to 4.0 inches
Water supplying capacity: 9 to 11 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.37; T value—2; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans; contrasting features—does not have a silica-cemented hardpan or a layer of clay accumulation; distinctive present vegetation—big sagebrush, Thurber needlegrass, Indian ricegrass, pine bluegrass
Inclusion 2: Position on landscape—concave parts of fan piedmonts; contrasting features—silica-cemented hardpan at a depth of less than 20 inches, does not have a layer of clay accumulation; distinctive present vegetation—black sagebrush, Indian ricegrass

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 34)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty
Roadfill: Good
Daily cover for landfill: Poor—cemented pan, small stones
Shallow excavations: Moderate—cemented pan, too clayey
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Moderate—seepage, cemented pan, slope
Embankments, dikes, and levees: Severe—seepage

TABLE 34.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Coils	1	2	3
Bluebunch wheatgrass	AGSP	5-10	5-10	2-5	---
Indian ricegrass	ORHY	5-10	5-10	15-25	20-30
Thurber needlegrass	STTH2	20-30	20-30	---	---
Sandberg bluegrass	POSE	2-5	2-5	---	2-5
Needleandthread	STCO4	2-5	2-5	5-10	10-20
Pine bluegrass	POSC	2-5	2-5	---	---
Western wheatgrass	AGSM	1-2	1-2	---	---
Basin wildrye	ELCI2	---	---	2-5	---
Bottlebrush squirreltail	SIHY	---	---	---	5-10
Other perennial grasses	PPGG	5-8	5-8	10-20	5-10
Tapertip hawksbeard	CRAC2	2-5	2-5	---	---
Arrowleaf balsamroot	BASA3	2-5	2-5	---	---
Lupine	LUPIN	2-5	2-5	---	---
White stoneseed	LIRU4	1-5	1-5	---	---
Other perennial forbs	PPFF	---	---	5-10	2-5
Annual forbs	AAFF	2-5	2-5	---	---
Big sagebrush	ARTR2	10-15	10-15	---	---
Rabbitbrush	CHRYS9	2-5	2-5	---	---
Antelope bitterbrush	PUTR2	1-10	1-10	---	---
Black sagebrush	ARARN	---	---	20-30	---
Bud sagebrush	ARSP5	---	---	2-5	---
Winterfat	EULA5	---	---	5-10	---
Small rabbitbrush	CHVIS	---	---	2-5	---
Wyoming big sagebrush	ARTRW*	---	---	---	15-20
Other shrubs	SSSS	5-10	5-10	10-20	5-10
Range site symbol		028B007N	028B007N	028B011N	028B010N
Potential production (lb/acre):					
Favorable years		1,000	1,000	900	800
Normal years		800	800	700	600
Unfavorable years		600	600	400	400

Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IVe, irrigated, and VIIs, nonirrigated
Range site symbol: 028B007N

282—Coils-Mau association

Map Unit Setting

Positions on landscape: Fan piedmonts, low hills
Elevation: 6,200 to 7,000 feet
Climatic data (average annual):
Precipitation—about 11 inches
Air temperature—about 45 degrees F
Frost-free season—about 90 days

Composition

Coils loam, 2 to 8 percent slopes (Haploxerollic Durargids - fine, montmorillonitic, frigid)—60 percent
Mau very stony loam, 15 to 30 percent slopes (Durixerollic Haplargids - clayey-skeletal, montmorillonitic, frigid)—30 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Camborthids, 0 to 4 percent slopes—6 percent
Inclusion 2: Xerollic Durorthids, shallow, 4 to 30 percent slopes—4 percent

Coils Soil

Positions on landscape: Summits of fan piedmonts
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Big sagebrush, Thurber needlegrass, Indian ricegrass, rabbitbrush
Typical profile:
0 to 5 inches—loam; 0 to 5 percent cobbles and stones and 0 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CL-ML; estimated AASHTO classification - A-4, A-6
5 to 26 inches—clay loam, gravelly clay loam, gravelly clay; 10 to 30 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
26 to 37 inches—cemented hardpan
37 to 60 inches or more—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); massive; hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2
Range in depth to hardpan: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—slow
Available water capacity: 3.3 to 4.0 inches
Water supplying capacity: 9 to 11 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.37; T value—2; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Mau Soil

Positions on landscape: Side slopes of low hills
Parent material: Kind—residuum, colluvium; source—andesite, basalt
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Big sagebrush, Indian ricegrass, rabbitbrush, Thurber needlegrass
Typical profile:
0 to 4 inches—very stony loam; 20 to 30 percent cobbles and stones and 45 to 55 percent pebbles (by weight); subangular blocky structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC; estimated AASHTO classification - A-2
4 to 24 inches—very gravelly clay, very gravelly clay loam; 0 to 10 percent cobbles and stones and 55 to 75 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
24 to 34 inches—extremely gravelly clay loam, very gravelly clay; 0 to 10 percent cobbles and stones and 55 to 90 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GP-GC; estimated AASHTO classification - A-2
34 inches—unweathered bedrock
Range in depth to bedrock: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 3.2 to 3.6 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.10; T value—2; wind erodibility group—8

Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth, concave inset fans; contrasting features—very deep, does not have a fine textured middle layer, does not have a silica-cemented hardpan; distinctive present vegetation—big sagebrush, Indian ricegrass, rabbitbrush, Thurber needlegrass
Inclusion 2: Position on landscape—eroded summits and side slopes of fan piedmont remnants; contrasting features—silica-cemented hardpan at a depth of less than 20 inches, does not have a layer of clay accumulation; distinctive present vegetation—black sagebrush, Thurber needlegrass

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 35)

Elements of Wildlife Habitat

Suitability of Coils soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor
Suitability of Mau soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Coils Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty
Roadfill: Good
Daily cover for landfill: Poor—cemented pan, small stones
Shallow excavations: Moderate—cemented pan, too clayey
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Moderate—seepage, cemented pan, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Mau Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty, small stones
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Coils soil—IVe, irrigated, and VIs, nonirrigated; Mau soil—VIIe, nonirrigated
Range site symbol: 028B007N

TABLE 35.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Coils	Mau	1	2
Bluebunch wheatgrass	AGSP	5-10	5-10	5-10	2-5
Indian ricegrass	ORHY	5-10	5-10	5-10	15-25
Thurber needlegrass	STTH2	20-30	20-30	20-30	---
Sandberg bluegrass	POSE	2-5	2-5	2-5	---
Needleandthread	STCO4	2-5	2-5	2-5	5-10
Pine bluegrass	POSC	2-5	2-5	2-5	---
Western wheatgrass	AGSM	1-2	1-2	1-2	---
Basin wildrye	ELCI2	---	---	---	2-5
Other perennial grasses	PPGG	5-8	5-8	5-8	10-20
Tapertip hawksbeard	CRAC2	2-5	2-5	2-5	---
Arrowleaf balsamroot	BASA3	2-5	2-5	2-5	---
Lupine	LUPIN	2-5	2-5	2-5	---
White stoneseed	LIRU4	1-5	1-5	1-5	---
Other perennial forbs	PPFF	---	---	---	5-10
Annual forbs	AAFF	2-5	2-5	2-5	---
Big sagebrush	ARTR2	10-15	10-15	10-15	---
Rabbitbrush	CHRYS9	2-5	2-5	2-5	---
Antelope bitterbrush	PUTR2	1-10	1-10	1-10	---
Black sagebrush	ARARN	---	---	---	20-30
Bud sagebrush	ARSP5	---	---	---	2-5
Winterfat	EULA5	---	---	---	5-10
Small rabbitbrush	CHVIS	---	---	---	2-5
Other shrubs	SSSS	5-10	5-10	5-10	10-20
Range site symbol		028B007N	028B007N	028B007N	028B011N
Potential production (lb/acre):					
Favorable years		1,000	1,000	1,000	900
Normal years		800	800	800	700
Unfavorable years		600	600	600	400

283—Coils-Umil association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 6,200 to 7,000 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Coils loam, 2 to 8 percent slopes (Haploxerollic Durargids - fine, montmorillonitic, frigid)—50 percent
Umil loam, 2 to 4 percent slopes (Xerollic Durorthids - loamy, mixed, frigid, shallow)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Haplargids, 2 to 8 percent slopes—5 percent
Inclusion 2: Xeric Torriorthents, 2 to 4 percent slopes—4 percent
Inclusion 3: Haploxerollic Durorthids, 2 to 4 percent slopes—1 percent

Coils Soil

Positions on landscape: Side slopes of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—short; shape—slightly concave
Dominant present vegetation: Big sagebrush, rabbitbrush, Indian ricegrass, bottlebrush squirreltail
Typical profile:
0 to 5 inches—loam; 0 to 5 percent cobbles and stones and 0 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CL-ML; estimated AASHTO classification - A-4, A-6
5 to 26 inches—clay loam, gravelly clay loam, gravelly clay; 10 to 30 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
26 to 37 inches—cemented hardpan
37 to 60 inches or more—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); massive; hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2
Range in depth to hardpan: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—slow
Available water capacity: 3.3 to 4.0 inches
Water supplying capacity: 9 to 11 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.37; T value—2; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Umil Soil

Positions on landscape: Summits of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Black sagebrush, shadscale, Indian ricegrass, bottlebrush squirreltail
Typical profile:
0 to 7 inches—loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML, ML; estimated AASHTO classification - A-4
7 to 12 inches—loam, gravelly loam; 20 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2, A-4
12 to 42 inches or more—indurated hardpan
Range in depth to hardpan: 10 to 14 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderately rapid
Available water capacity: 1.5 to 1.8 inches
Water supplying capacity: 7 to 9 inches
Runoff: Slow
Hydrologic group: D
Erosion factors (upper layer): K value—43; T value—2; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—lower side slopes of fan piedmont remnants; contrasting features—

very deep, does not have a silica-cemented hardpan; distinctive present vegetation—big sagebrush, rabbitbrush, Indian ricegrass, bottlebrush squirreltail

Inclusion 2: Position on landscape—inset fans; contrasting features—very deep, does not have a layer of clay accumulation or a hardpan; distinctive present vegetation—big sagebrush, rabbitbrush, Indian ricegrass, bottlebrush squirreltail

Inclusion 3: Position on landscape—shoulders of fan piedmont remnants; contrasting features—does not have a layer of clay accumulation, moderately deep to a silica-cemented hardpan; distinctive present vegetation—big sagebrush, rabbitbrush, Indian ricegrass, bottlebrush squirreltail

Major Uses

Current uses: Rangeland, wildlife habitat

Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 36)

Elements of Wildlife Habitat

Suitability of Coils soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Suitability of Umil soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Coils Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty
Roadfill: Good
Daily cover for landfill: Poor—cemented pan, small stones
Shallow excavations: Moderate—cemented pan, too clayey
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Moderate—seepage, cemented pan, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Umil Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—cemented pan
Pond reservoir areas: Severe—seepage
Embankments, dikes and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Coils soil—IVe, irrigated, and VIIs, nonirrigated; Umil soil—VIIs, nonirrigated

Range site symbol: Coils soil—028B007N; Umil soil—028B011N

TABLE 36.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Coils	Umil	1	2	3
Bluebunch wheatgrass	AGSP	5-10	2-5	5-10	5-10	5-10
Indian ricegrass	ORHY	5-10	15-25	5-10	5-10	5-10
Thurber needlegrass	STTH2	20-30	---	20-30	20-30	20-30
Sandberg bluegrass	POSE	2-5	---	2-5	2-5	2-5
Needleandthread	STCO4	2-5	5-10	2-5	2-5	2-5
Pine bluegrass	POSC	2-5	---	2-5	2-5	2-5
Western wheatgrass	AGSM	1-2	---	1-2	1-2	1-2
Basin wildrye	ELCI2	---	2-5	---	---	---
Other perennial grasses	PPGG	5-8	10-20	5-8	5-8	5-8
Tapertip hawksbeard	CRAC2	2-5	---	2-5	2-5	2-5
Arrowleaf balsamroot	BASA3	2-5	---	2-5	2-5	2-5
Lupine	LUPIN	2-5	---	2-5	2-5	2-5
White stoneseed	LIRU4	1-5	---	1-5	1-5	1-5
Other perennial forbs	PPFF	---	5-10	---	---	---
Annual forbs	AAFF	2-5	---	2-5	2-5	2-5
Big sagebrush	ARTR2	10-15	---	10-15	10-15	10-15
Rabbitbrush	CHRYS9	2-5	---	2-5	2-5	2-5
Antelope bitterbrush	PUTR2	1-10	---	1-10	1-10	1-10
Black sagebrush	ARARN	---	20-30	---	---	---
Bud sagebrush	ARSP5	---	2-5	---	---	---
Winterfat	EULA5	---	5-10	---	---	---
Small rabbitbrush	CHVIS	---	2-5	---	---	---
Other shrubs	SSSS	5-10	10-20	5-10	5-10	5-10
Range site symbol		028B007N	028B011N	028B007N	028B007N	028B007N
Potential production (lb/acre):						
Favorable years		1,000	900	1,000	1,000	1,000
Normal years		800	700	800	800	800
Unfavorable years		600	400	600	600	600

291—Ricert-Pumper-Clowfin association

Map Unit Setting

Positions on landscape: Fan piedmonts, fan skirts
Elevation: 5,600 to 6,000 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 90 days

Composition

Ricert sandy loam, 0 to 4 percent slopes (Duric Natrargids - fine-loamy, mixed, mesic)—45 percent
Pumper sandy loam, cool, 0 to 2 percent slopes (Typic Camborthids - sandy-skeletal, mixed, mesic)—35 percent
Clowfin sandy loam, 0 to 4 percent slopes (Typic Torriorthents - loamy-skeletal, mixed (calcareous), mesic)—15 percent
Contrasting inclusion as follows:
Inclusion 1: Broyles silt loam, cool, 0 to 2 percent slopes (Duric Camborthids - coarse-loamy, mixed, mesic)—5 percent

Ricert Soil

Positions on landscape: Lower part of fan piedmonts
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, winterfat, globemallow, small rabbitbrush
Typical profile:
0 to 5 inches—sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4, A-2
5 to 14 inches—clay loam, loam; 0 to 15 percent pebbles (by weight); prismatic structure; hard, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CL; estimated AASHTO classification - A-6, A-7
14 to 20 inches—loam, silt loam, clay loam; 0 to 5 percent cobbles and stones and 5 to 20 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CL; estimated AASHTO classification - A-6
20 to 60 inches or more—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly loamy sand; 0 to 15 percent cobbles and stones and 50 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - GM, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 20 inches—moderately slow; below this depth—moderately rapid
Available water capacity: 4.3 to 6.3 inches
Water supplying capacity: 5 to 7 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.20; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Low

Pumper Soil

Positions on landscape: Fan skirts
Parent material: Loess with high content of volcanic ash over sandy alluvium
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Shadscale, bud sagebrush, small rabbitbrush, winterfat, needleandthread
Typical profile:
0 to 13 inches—sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
13 to 60 inches or more—stratified very gravelly sand to extremely gravelly coarse sand; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.7); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - GP; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 13 inches—moderate; below this depth—rapid
Available water capacity: 2.8 to 4.5 inches
Water supplying capacity: 5 to 7 inches
Runoff: Very slow
Hydrologic group: B

Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Clowfin Soil

Positions on landscape: Fan skirts
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Winterfat, shadscale, small rabbitbrush
Typical profile:
0 to 4 inches—sandy loam; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-2
4 to 40 inches—stratified very gravelly sandy loam to very gravelly loam; 10 to 25 percent cobbles and stones and 40 to 60 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2, A-4
40 to 60 inches or more—extremely gravelly sand; 5 to 30 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GP, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Moderately rapid
Available water capacity: 3.2 to 4.6 inches
Water supplying capacity: 4.5 to 7.5 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—3; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusion

Inclusion 1: Position on landscape—smooth fan aprons; contrasting feature—fine sandy loam throughout the profile; distinctive present vegetation—shadscale, bud sagebrush, winterfat, globemallow, small rabbitbrush

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 37)

Elements of Wildlife Habitat

Suitability of Ricert soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—very poor
Shallow water areas—very poor
Suitability of Pumper soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—very poor
Shallow water areas—very poor
Suitability of Clowfin soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Ricert Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess sodium
Sand: Probable source
Gravel: Probable source

Pumper Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Poor—too sandy, seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage

TABLE 37.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name			Inclusion number--
		Ricert	Pumper	Clowfin	1
Bottlebrush squirreltail	SIHY	2-5	2-5	2-5	2-5
Needleandthread	STCO4	5-10	5-10	---	5-10
Indian ricegrass	ORHY	5-10	5-15	15-25	5-10
Sand dropseed	SPCR	---	2-5	---	---
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10
Perennial forbs	PPFF	5-10	5-15	5-10	5-10
Shadscale	ATCO	30-40	---	---	30-40
Bud sagebrush	ARSP5	5-10	2-5	---	5-10
Fourwing saltbush	ATCA2	3-5	10-20	1-2	3-5
Winterfat	EULA5	2-5	10-15	30-45	2-5
Ephedra	EPHED	---	2-5	---	---
Other shrubs	SSSS	5-15	10-15	5-15	5-15
Range site symbol		028B017N	028B014N	028B013N	028B017N
Potential production (lb/acre):					
Favorable years		700	450	800	700
Normal years		500	300	600	500
Unfavorable years		250	125	300	250

Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Clowfin Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—flooding
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Moderate—thin layer, seepage, piping
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: Ricert soil—IVe, irrigated, and VIIs, nonirrigated; Pumper soil—IVs, irrigated, and VIIc, nonirrigated; Clowfin soil—IIIe, irrigated, and VIIc, nonirrigated
Range site symbol: Ricert soil—028B017N; Pumper soil—028B014N; Clowfin soil—028B013N

292—Ricert-Silverado association

Map Unit Setting

Positions on landscape: Fan piedmonts, fan skirts
Elevation: 6,000 to 6,500 feet
Climatic data (average annual):
Precipitation—about 8 inches
Air temperature—about 45 degrees F
Frost-free season—about 95 days

Composition

Ricert sandy loam, 2 to 8 percent slopes (Duric Natragids - fine-loamy, mixed, mesic)—50 percent
Silverado sandy loam, 4 to 15 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, frigid)—35 percent
Contrasting inclusions as follows:
Inclusion 1: Molion loam, 2 to 8 percent slopes (Haploxerollic Durorthids - loamy-skeletal, mixed, frigid, shallow)—8 percent
Inclusion 2: Hayeston sandy loam, 2 to 8 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—4 percent
Inclusion 3: Lopwash loam, 0 to 4 percent slopes (Typic Camborthids - loamy-skeletal, mixed, frigid)—3 percent

Ricert Soil

Positions on landscape: Fan piedmonts
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, winterfat, small rabbitbrush, Indian ricegrass, bottlebrush squirreltail
Typical profile:
0 to 5 inches—sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4, A-2
5 to 14 inches—clay loam, loam; 0 to 15 percent pebbles (by weight); prismatic structure; hard, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CL; estimated AASHTO classification - A-6, A-7
14 to 20 inches—loam, silt loam, clay loam; 0 to 5 percent cobbles and stones and 5 to 20 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CL; estimated AASHTO classification - A-6
20 to 60 inches or more—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly loamy sand; 0 to 15 percent cobbles and stones and 50 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - GM, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 20 inches—moderately slow; below this depth—moderately rapid
Available water capacity: 4.3 to 6.3 inches
Water supplying capacity: 5 to 7 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.20; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Low

Silverado Soil

Positions on landscape: Fan skirts
Parent material: Mixed alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, small rabbitbrush, Indian ricegrass, bottlebrush squirreltail
Typical profile:
0 to 6 inches—sandy loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; neutral (pH 7.1); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
6 to 14 inches—sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
14 to 35 inches—gravelly sandy loam, sandy loam; 15 to 45 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, SM; estimated AASHTO classification - A-1

35 to 60 inches or more—very gravelly coarse sand; 55 to 65 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GP; estimated AASHTO classification - A-1

Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 35 inches—moderately rapid; below this depth—very rapid
Available water capacity: 4.2 to 5.5 inches
Water supplying capacity: 7 to 9 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.32; T value—3; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—slightly convex areas of fan piedmont remnants; contrasting features—very gravelly throughout the profile, shallow to a hardpan; distinctive present vegetation—black sagebrush
Inclusion 2: Position on landscape—lower part of inset fans; contrasting feature—does not have silica cementation throughout the profile; distinctive present vegetation—big sagebrush, grasses
Inclusion 3: Position on landscape—upper part of inset fans; contrasting features—very gravelly throughout the profile, does not have silica cementation or a layer of clay accumulation; distinctive present vegetation—shadscale, bud sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 38)

Elements of Wildlife Habitat

Suitability of Ricert soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—very poor
Shallow water areas—very poor
Suitability of Silverado soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Ricert Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess sodium
Sand: Probable source
Gravel: Probable source

Silverado Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action, slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: Ricert soil—IVe, irrigated, and VIIs, nonirrigated; Silverado soil—IVe, irrigated, and VIIc, nonirrigated
Range site symbol: Ricert soil—028B017N; Silverado soil—028B010N

TABLE 38.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Ricert	Silverado	1	2	3
Bottlebrush squirreltail	SIHY	2-5	5-10	---	5-10	2-5
Needleandthread	STCO4	5-10	10-20	5-10	10-20	5-10
Indian ricegrass	ORHY	5-10	20-30	15-25	20-30	5-10
Sandberg bluegrass	POSE	---	2-5	---	2-5	---
Bluebunch wheatgrass	AGSP	---	---	2-5	---	---
Basin wildrye	ELCI2	---	---	2-5	---	---
Other perennial grasses	PPGG	5-10	5-10	10-20	5-10	5-10
Perennial forbs	PPFF	5-10	2-5	5-10	2-5	5-10
Shadscale	ATCO	30-40	---	---	---	30-40
Bud sagebrush	ARSP5	5-10	---	2-5	---	5-10
Fourwing saltbush	ATCA2	3-5	---	---	---	3-5
Winterfat	EULA5	2-5	---	5-10	---	2-5
Wyoming big sagebrush	ARTRW*	---	15-20	---	15-20	---
Black sagebrush	ARARN	---	---	20-30	---	---
Small rabbitbrush	CHVIS	---	---	2-5	---	---
Other shrubs	SSSS	5-15	5-10	10-20	5-10	5-15
Range site symbol		028B017N	028B010N	028B011N	028B010N	028B017N
Potential production (lb/acre):						
Favorable years		700	800	900	800	700
Normal years		500	600	700	600	500
Unfavorable years		250	400	400	400	250

293—Ricert-Nevador association

Map Unit Setting

Positions on landscape: Lower part of fan piedmonts
Elevation: 5,500 to 6,000 feet
Climatic data (average annual):
Precipitation—about 8 inches
Air temperature—about 47 degrees F
Frost-free season—about 100 days

Composition

Ricert sandy loam, 0 to 4 percent slopes (Duric Natrargids - fine-loamy, mixed, mesic)—75 percent
Nevador very fine sandy loam, 0 to 4 percent slopes (Durixerollic Haplargids - fine-loamy, mixed, mesic)—15 percent
Contrasting inclusion as follows:
Inclusion 1: Durixerollic Camborthids, 2 to 8 percent slopes—10 percent

Ricert Soil

Positions on landscape: Slightly dissected fan piedmonts
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, Indian ricegrass, bottlebrush squirreltail
Typical profile:
0 to 5 inches—sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4, A-2
5 to 14 inches—clay loam, loam; 0 to 15 percent pebbles (by weight); prismatic structure; hard, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CL; estimated AASHTO classification - A-6, A-7
14 to 20 inches—loam, silt loam, clay loam; 0 to 5 percent cobbles and stones and 5 to 20 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CL; estimated AASHTO classification - A-6
20 to 60 inches or more—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly loamy sand; 0 to 15 percent cobbles and stones and 50 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - GM, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 20 inches—moderately slow; below this depth—moderately rapid
Available water capacity: 4.3 to 6.3 inches
Water supplying capacity: 5 to 7 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.20; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Low

Nevador Soil

Positions on landscape: Slightly dissected fan piedmonts
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, basin wildrye, Sandberg bluegrass
Typical profile:
0 to 5 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4
5 to 22 inches—clay loam, sandy clay loam, loam; 0 to 10 percent cobbles and stones and 10 to 20 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, CL; estimated AASHTO classification - A-6, A-7
22 to 60 inches or more—stratified gravelly fine sandy loam to loamy sand; 0 to 10 percent cobbles and stones and 10 to 30 percent pebbles (by weight); massive; hard, friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - SM; estimated AASHTO classification - A-2, A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Through the argillic horizon—moderately slow; below this horizon—moderately rapid
Available water capacity: 7.3 to 8.5 inches

Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Moderate

Contrasting Inclusion

Inclusion 1: Position on landscape—inset fans; contrasting features—nonsaline, nonsodic, fine sandy loam throughout the profile; distinctive present vegetation—Wyoming big sagebrush, basin wildrye, Sandberg bluegrass

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 39)

Elements of Wildlife Habitat

Suitability of Ricert soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—very poor
Shallow water areas—very poor
Suitability of Nevador soil for named elements:

TABLE 39.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		Inclusion number--
		Ricert	Nevador	1
Indian ricegrass	ORHY	5-15	2-5	2-5
Bottlebrush squirreltail	SIHY	5-10	2-5	2-5
Bluegrass	POA++	2-5	---	---
Thurber needlegrass	STTH2	---	20-30	20-30
Bluebunch wheatgrass	AGSP	---	5-10	5-10
Pine bluegrass	POSC	---	2-5	2-5
Other perennial grasses	PPGG	---	2-10	2-10
Globemallow	SPHAE	2-3	2-3	2-3
Other perennial forbs	PPFF	2-4	5-10	5-10
Shadscale	ATCO	30-35	---	---
Bud sagebrush	ARSP5	25-30	---	---
Wyoming big sagebrush	ARTRW*	---	15-20	15-20
Downy rabbitbrush	CHVIP	---	2-5	2-5
Other shrubs	SSSS	2-5	2-8	2-8
Range site symbol		024X002N	024X005N	024X005N
Potential production (lb/acre):				
Favorable years		700	800	800
Normal years		450	600	600
Unfavorable years		300	400	400

Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Ricert Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess sodium
Sand: Probable source
Gravel: Probable source

Nevador Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, excess salt
Roadfill: Good
Daily cover for landfill: Fair—too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Moderate—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Ricert soil—IVs, irrigated, and VIIs, nonirrigated; Nevador soil—IIe, irrigated, and VIc, nonirrigated
Range site symbol: Ricert soil—024X002N; Nevador soil—024X005N

300—Rutab loam

Map Unit Setting

Positions on landscape: Fan skirts
Elevation: 6,000 to 6,600 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 85 days

Composition

Rutab loam, 0 to 2 percent slopes (Xerollic Camborthids - loamy-skeletal, mixed, frigid)—90 percent
Contrasting inclusions as follows:
Inclusion 1: Fluventic Haploxerolls—5 percent
Inclusion 2: Pedoli loam, 0 to 4 percent slopes (Xerollic Haplargids - fine-loamy, mixed, frigid)—5 percent

Rutab Soil

Positions on landscape: Fan skirts
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, Indian ricegrass, needlegrass
Typical profile:
0 to 6 inches—loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, ML; estimated AASHTO classification - A-4
6 to 22 inches—very gravelly sandy loam, very gravelly loam, gravelly loam; 25 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2, A-4
22 to 60 inches or more—extremely gravelly sandy loam, extremely gravelly loamy sand, very gravelly sandy loam; 65 to 80 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 22 inches—moderate; below this depth—rapid
Available water capacity: 3.2 to 5.3 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.32; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—flood plains; contrasting features—frequently flooded, dark-colored upper layer; distinctive present vegetation—basin wildrye, basin big sagebrush, Nevada bluegrass
Inclusion 2: Position on landscape—adjacent smooth, lower lying fan piedmont remnants; contrasting features—gravelly throughout the profile, moderately fine textured middle layer; distinctive present vegetation—Wyoming big sagebrush, rabbitbrush, Indian ricegrass, needlegrass

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 40)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

TABLE 40.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Rutab	1	2
Indian ricegrass	ORHY	20-30	---	20-30
Needleandthread	STCO4	10-20	---	10-20
Bottlebrush squirreltail	SIHY	5-10	---	5-10
Sandberg bluegrass	POSE	2-5	---	2-5
Basin wildrye	ELCI2	---	30-50	---
Wheatgrass	AGROP2	---	2-5	---
Nevada bluegrass	PONE3	---	2-5	---
Other perennial grasses	PPGG	5-10	15-25	5-10
Perennial forbs	PPFF	2-5	2-5	2-5
Wyoming big sagebrush	ARTRW*	15-20	1-2	15-20
Basin big sagebrush	ARTRT*	---	5-10	---
Other shrubs	SSSS	5-10	5-8	5-10
Range site symbol		028B010N	028B003N	028B010N
Potential production (lb/acre):				
Favorable years		800	2,600	800
Normal years		600	1,250	600
Unfavorable years		400	800	400

Interpretive Groups

Range site symbol: 028B010N

Capability classification: IIIs, irrigated, and VIIc, nonirrigated

311—Eightmile-Loncan-Glean association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 6,500 to 8,000 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Eightmile very gravelly loam, 30 to 75 percent slopes (Xeric Torriorthents - loamy-skeletal, mixed, nonacid, frigid, shallow)—50 percent
Loncan gravelly loam, 30 to 50 percent slopes (Aridic Haploxerolls - loamy-skeletal, mixed, frigid)—20 percent
Glean very gravelly loam, 30 to 50 percent slopes (Pachic Haploxerolls - loamy-skeletal, mixed, frigid)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Lithic Haploxerolls, 8 to 30 percent slopes—5 percent
Inclusion 2: Rock outcrop—5 percent
Inclusion 3: Welch loam, drained, 2 to 8 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—3 percent
Inclusion 4: Welch loam, 2 to 8 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—2 percent

Eightmile Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—shale, sandstone, quartzite
Slope features: Length—long; shape—smooth
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, rabbitbrush, Thurber needlegrass
Typical profile:
0 to 3 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
3 to 9 inches—very gravelly loam, very cobbly loam, extremely gravelly loam; 5 to 30 percent cobbles and stones and 30 to 80 percent pebbles (by weight); massive; soft, friable; mildly alkaline (pH 7.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2, A-4
9 to 24 inches—weathered bedrock
24 inches—unweathered bedrock
Range in depth to bedrock: 6 to 14 inches
Depth to seasonal high water table: 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 0.6 to 1.0 inch
Water supplying capacity: 11 to 15 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—1; wind erodibility group—8
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Loncan Soil

Positions on landscape: Upper side slopes of mountains
Parent material: Kind—residuum, colluvium; source—sedimentary and volcanic rocks
Slope features: Length—long; shape—smooth to convex
Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, Thurber needlegrass, rabbitbrush
Typical profile:
0 to 10 inches—gravelly loam; 0 to 15 percent cobbles and stones and 15 to 40 percent pebbles (by weight); platy structure; soft, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, CL; estimated AASHTO classification - A-6
10 to 35 inches—very gravelly loam, extremely cobbly loam, very gravelly sandy clay loam; 10 to 45 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
35 inches—unweathered bedrock
Range in depth to bedrock: 21 to 38 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Above the bedrock—moderate
Available water capacity: 2.2 to 4.0 inches
Water supplying capacity: 12 to 14 inches
Runoff: Rapid
Hydrologic group: C

Erosion factors (upper layer): K value—0.17; T value—2; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Glean Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum, colluvium; source—chert, shale, volcanic rock
Slope features: Length—short; shape—concave
Dominant present vegetation: Mountain big sagebrush, basin wildrye, snowberry, Idaho fescue, bluebunch wheatgrass
Typical profile:
0 to 14 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; slightly acid (pH 6.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
14 to 56 inches—very gravelly sandy loam, very gravelly loam; 10 to 25 percent cobbles and stones and 40 to 75 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 6.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
56 inches—unweathered bedrock
Range in depth to bedrock: 50 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 3.4 to 5.6 inches
Water supplying capacity: 11 to 15 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.10; T value—5; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—moderate
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests of mountains; contrasting feature—hard bedrock at a depth of 4 to 20 inches; distinctive present vegetation—low sagebrush, Idaho fescue
Inclusion 2: Position on landscape—shoulders and crests of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren
Inclusion 3: Position on landscape—entrenched drainageways; contrasting features—very deep, moderately wet; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 4: Position on landscape—drainageways; contrasting features—very deep, wet; distinctive present vegetation—quaking aspen, willow, sedge

Major Uses

Rangeland, woodland, wildlife habitat

Potential Native Plant Community (Table 41)

Woodland

Eightmile Soil

Site index for common trees: Singleleaf pinyon—20; Utah juniper—20
Most important native understory plants: Bluebunch wheatgrass, basin wildrye, Idaho fescue, Thurber needlegrass, big sagebrush

Elements of Wildlife Habitat

Suitability of Eightmile soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—fair
Suitability of Loncan soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Glean soil for named elements:
Wild herbaceous plants (nonirrigated)—good
Shrubs (nonirrigated)—good

Ratings for Selected Uses

Eightmile Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—depth to rock, droughty, small stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Loncan Soil

Suitability and limitations for the following uses:

TABLE 41.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Eightmile	Locan	Glean	1	2	3	4
Indian ricegrass	ORHY	X	---	---	2-5	---	---	---
Needleandthread	STCO4	X	---	---	---	---	---	---
Pine bluegrass	POSC	X	2-5	2-5	5-10	---	---	---
Bluebunch wheatgrass	AGSP	X	10-20	10-20	5-10	---	---	---
Nevada bluegrass	PONE3	X	---	---	---	---	5-10	5-10
Thurber needlegrass	STTH2	X	5-10	5-10	2-5	---	---	---
Bottlebrush squirreltail	SIHY	X	---	---	2-5	---	---	---
Sandberg bluegrass	POSE	X	---	---	---	---	---	---
Basin wildrye	ELCI2	---	2-5	2-5	---	---	50-60	---
Idaho fescue	FEID	---	2-5	2-5	10-15	---	---	---
Western wheatgrass	AGSM	---	1-5	1-5	---	---	---	---
Letterman needlegrass	STLE4	---	---	---	2-5	---	---	---
Sedge	CAREX	---	---	---	---	---	1-5	5-10
Mat muhly	MURI	---	---	---	---	---	2-5	---
Tufted hairgrass	DECA5	---	---	---	---	---	---	30-60
Alpine timothy	PHAL2	---	---	---	---	---	---	5-10
Other perennial grasses	PPGG	X	10-20	10-20	10-15	---	15-20	2-10
Lupine	LUPIN	---	---	---	---	---	2-5	---
Sierra clover	TRWO	---	---	---	---	---	---	2-5
Cinquefoil	POTEN	---	---	---	---	---	---	2-5
Other perennial forbs	PPFF	X	5-12	5-12	5-10	---	5-10	10-20
Big sagebrush	ARTR2	X	---	---	---	---	---	---
Utah juniper	JUOS	X	---	---	---	---	---	---
Singleleaf pinyon	PIMO	X	---	---	---	---	---	---
Serviceberry	AMELA	---	2-10	2-10	---	---	---	---
Antelope bitterbrush	PUTR2	---	5-10	5-10	---	---	---	---
Horsebrush	TETRA3	---	1-2	1-2	2-5	---	---	---
Mountain big sagebrush	ARTRV	---	15-25	15-25	---	---	---	---
Low sagebrush	ARAR8	---	---	---	20-35	---	---	---
Low rabbitbrush	CHVIH2	---	---	---	2-5	---	---	---
Snowberry	SYMPH	---	---	---	2-5	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	---	10-15	---
Rubber rabbitbrush	CHNA2	---	---	---	---	---	2-5	---
Willow	SALIX	---	---	---	---	---	---	2-5
Other shrubs	SSSS	X	5-15	5-15	5-10	---	---	---
Range site symbol		---	028B030N	028B030N	028B038N	BARREN	025X003N	025X005N
Woodland site symbol		025X062N	---	---	---	---	---	---
Potential production (lb/acre):								
Favorable years		500	1,100	1,100	800	---	2,500	2,000
Normal years		300	800	800	600	---	1,900	1,700
Unfavorable years		250	600	600	400	---	1,200	1,000

Rangeland seeding: Fair—droughty, erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Glean Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones
Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIe, nonirrigated
Woodland suitability group: Eightmile soil—3r
Range site symbol: Loncan soil—028B030N; Glean soil—028B030N

321—Mau-Shagnasty-Eightmile association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 6,400 to 7,800 feet
Climatic data (average annual):
Precipitation—about 13 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Mau stony loam, 15 to 30 percent slopes (Durixerollic Haplargids - clayey-skeletal, montmorillonitic, frigid)—40 percent
Shagnasty very stony loam, 15 to 30 percent slopes (Typic Argixerolls - fine, montmorillonitic, frigid)—25 percent
Eightmile very gravelly loam, 15 to 30 percent slopes (Xeric Torriorthents - loamy-skeletal, mixed, nonacid, frigid, shallow)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Camborthids, 4 to 15 percent slopes—5 percent
Inclusion 2: Lithic Xeric Torriorthents, 30 to 75 percent slopes—5 percent
Inclusion 3: Welch loam, drained, 0 to 4 percent slopes—4 percent
Inclusion 4: Lithic Haplargids, 8 to 30 percent slopes—1 percent

Mau Soil

Positions on landscape: Lower side slopes of mountains
Parent material: Kind—residuum, colluvium; source—andesite, basalt
Slope features: Length—long; shape—convex
Dominant present vegetation: Big sagebrush, Thurber needlegrass, bluegrass
Typical profile:
0 to 4 inches—stony loam; 5 to 10 percent cobbles and stones and 20 to 45 percent pebbles (by weight); subangular blocky structure; soft, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, CL, GM-GC, GC; estimated AASHTO classification - A-4, A-6
4 to 24 inches—very gravelly clay, very gravelly clay loam; 0 to 10 percent cobbles and stones and 55 to 75 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
24 to 34 inches—extremely gravelly clay loam, very gravelly clay; 0 to 10 percent cobbles and stones and 55 to 90 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GP-GC; estimated AASHTO classification - A-2
34 inches—unweathered bedrock
Range in depth to bedrock: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 3.3 to 3.8 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Shagnasty Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum, colluvium; source—shale, sandstone, quartzite
Slope features: Length—long; shape—slightly convex, slightly concave
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, Idaho fescue
Typical profile:
0 to 12 inches—very stony loam; 25 to 40 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, SM-SC; estimated AASHTO classification - A-2, A-4, A-6
12 to 36 inches—clay, clay loam; 5 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); prismatic structure; extremely hard, very firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
36 to 59 inches—cobbly clay loam, cobbly silty clay loam; 15 to 25 percent cobbles and stones and 15 to 35 percent pebbles (by weight); massive; very hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CH, MH; estimated AASHTO classification - A-6, A-7

59 inches—weathered bedrock
Range in depth to bedrock: 50 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 7.6 to 8.7 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.17; T value—5; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Eightmile Soil

Positions on landscape: Upper side slopes of mountains
Parent material: Kind—residuum; source—sandstone, shale, quartzite
Slope features: Length—short; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, Idaho fescue
Typical profile:
0 to 3 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
3 to 9 inches—very gravelly loam, very cobbly loam, extremely gravelly loam; 5 to 30 percent cobbles and stones and 30 to 80 percent pebbles (by weight); massive; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2, A-4
9 to 24 inches—weathered bedrock
24 inches—unweathered bedrock
Range in depth to bedrock: 6 to 14 inches
Depth to seasonal high water table: 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 0.6 to 1.0 inch
Water supplying capacity: 11 to 15 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—broad crests and upper side slopes of mountains; contrasting features—moderately deep to bedrock, does not have a layer of clay accumulation; distinctive present vegetation—big sagebrush
Inclusion 2: Position on landscape—convex upper side slopes of contrasting features—shallow to hard bedrock; distinctive present vegetation—singleleaf pinyon, Utah juniper
Inclusion 3: Position on landscape—narrow, entrenched drainageways; contrasting features—very deep, moderately wet, does not have a layer of clay accumulation; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 4: Position on landscape—narrow crests and upper side slopes of mountains; contrasting features—shallow to hard bedrock; distinctive present vegetation—big sagebrush, bluebunch wheatgrass

Major Uses

Rangeland, wildlife habitat, woodland

Potential Native Plant Community (Table 42)

Woodland

Shagnasty Soil

Site index for common trees: Singleleaf pinyon—55; Utah juniper—55
Most important native understory plants: Thurber needlegrass, Indian ricegrass, basin wildrye, bluebunch wheatgrass, big sagebrush, antelope bitterbrush

Eightmile Soil

Site index for common trees: Singleleaf pinyon—20; Utah juniper—20
Most important native understory plants: Thurber needlegrass, bluebunch wheatgrass, big sagebrush, antelope bitterbrush

Elements of Wildlife Habitat

Suitability of Mau soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Shagnasty soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Eightmile soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—poor

TABLE 42.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Mau	Shagnasty	Eightmile	1	2	3	4
Bluebunch wheatgrass	AGSP	5-10	X	X	5-10	---	40-80	X
Indian ricegrass	ORHY	5-10	X	X	5-10	---	2-5	X
Thurber needlegrass	STTH2	20-30	X	X	20-30	---	5-15	X
Sandberg bluegrass	POSE	2-5	X	X	2-5	---	---	X
Needleandthread	STCO4	2-5	X	X	2-5	---	---	---
Pine bluegrass	POSC	2-5	X	X	2-5	---	---	X
Western wheatgrass	AGSM	1-2	---	---	1-2	5-10	---	---
Nevada bluegrass	PONE3	---	X	X	---	5-10	---	---
Bottlebrush squirreltail	SIHY	---	X	X	---	---	---	X
Basin wildrye	ELCI2	---	---	---	---	30-50	2-5	---
Black sagebrush	ARARN	---	---	---	---	---	---	X
Other perennial grasses	PPGG	5-8	X	X	5-8	5-15	2-10	X
Tapertip hawksbeard	CRAC2	2-5	---	---	2-5	---	2-5	---
Arrowleaf balsamroot	BASA3	2-5	---	---	2-5	---	---	---
Lupine	LUPIN	2-5	---	---	2-5	---	---	---
White stoneseed	LIRU4	1-5	---	---	1-5	---	---	---
Other perennial forbs	PPFF	---	X	X	---	5-10	2-10	X
Annual forbs	AAFF	2-5	---	---	2-5	---	---	---
Big sagebrush	ARTR2	10-15	X	X	10-15	---	2-10	---
Rabbitbrush	CHRYS9	2-5	---	---	2-5	---	---	---
Antelope bitterbrush	PUTR2	1-10	---	---	1-10	---	T-10	---
Utah juniper	JUOS	---	X	X	---	---	---	X
Singleleaf pinyon	PIMO	---	X	X	---	---	---	X
Basin big sagebrush	ARTRT*	---	---	---	---	5-10	---	---
Mountain big sagebrush	ARTRV	---	---	---	---	1-2	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5	---	---
Other shrubs	SSSS	5-10	X	X	5-10	5-10	2-8	X
Range site symbol		028B007N	---	---	028B007N	028B024N	025X015N	---
Woodland site symbol		---	025X062N	025X062N	---	---	---	025X063N
Potential production (lb/acre):								
Favorable years		1,000	500	500	1,000	2,800	1,000	400
Normal years		800	300	300	800	1,700	700	300
Unfavorable years		600	250	250	600	1,000	500	200

Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Mau Soil

Suitability and limitations for the following uses:

Rangeland seeding: Fair—erodes easily
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Shagnasty Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones
Roadfill: Poor—low strength, shrink-swell
Daily cover for landfill: Poor—hard to pack, too clayey, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer, hard to pack, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Eightmile Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—depth to rock, droughty, small stones
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Mau soil—VIIe, nonirrigated; Shagnasty soil—VIIs, nonirrigated; Eightmile soil—VIIe, nonirrigated
Range site symbol: Mau soil—028B007N
Woodland suitability group: Shagnasty soil—2x; Eightmile soil—3d

330—Hopeka-Solak-Ados association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 6,500 to 8,000 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Hopeka very gravelly loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents - loamy-skeletal, carbonatic, frigid)—45 percent
Solak very gravelly loam, 15 to 30 percent slopes (Lithic Xeric Torriorthents - loamy-skeletal, mixed (calcareous), frigid)—25 percent
Ados gravelly loam, 4 to 15 percent slopes (Xerollic Paleorthids - loamy-skeletal, carbonatic, frigid)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—6 percent
Inclusion 2: Aridic Durixerolls, 8 to 30 percent slopes—5 percent
Inclusion 3: Aridic Haploxerolls, 2 to 8 percent slopes—4 percent

Hopeka Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—limestone, dolostone, sandstone
Slope features: Length—short; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, black sagebrush, mountainmahogany, Indian ricegrass
Typical profile:
0 to 9 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2
9 inches—unweathered bedrock
Range in depth to bedrock: 4 to 10 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 0.2 to 0.7 inch
Water supplying capacity: 6 to 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Solak Soil

Positions on landscape: Ridgetops, upper side slopes of mountains
Parent material: Kind—residuum; source—siliceous shale, tuff, chert
Slope features: Length—short; shape—convex
Dominant present vegetation: Black sagebrush, needleandthread, bud sagebrush
Typical profile:
0 to 10 inches—very gravelly loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2, A-4
10 inches—unweathered bedrock
Range in depth to bedrock: 10 to 14 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 0.7 to 1.3 inches
Water supplying capacity: 7 to 9 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.05; T value—1; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Ados Soil

Positions on landscape: Lower part of side slopes of mountains
Parent material: Kind—alluvium, colluvium; source—limestone, dolostone
Slope features: Length—short; shape—concave
Dominant present vegetation: Singleleaf pinyon, Utah juniper, black sagebrush, Indian ricegrass
Typical profile:
0 to 4 inches—gravelly loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, ML; estimated AASHTO classification - A-2, A-4

4 to 30 inches—very gravelly loam, very gravelly sandy loam; 50 to 75 percent pebbles (by weight); massive; soft, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
30 to 39 inches—indurated hardpan
39 inches—unweathered bedrock
Range in depth to hardpan: 20 to 34 inches
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 2 to 4 inches
Water supplying capacity: 10 to 12 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.28; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex upper part of side slopes, crests of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren
Inclusion 2: Position on landscape—north-facing upper side slopes of mountains; contrasting feature—thick, dark-colored upper layer; distinctive present vegetation—singleleaf pinyon, Utah juniper, big sagebrush
Inclusion 3: Position on landscape—drainageways; contrasting feature—very deep; distinctive present vegetation—big sagebrush, rabbitbrush, Thurber needlegrass

Major Uses

Rangeland, woodland, wildlife habitat

Potential Native Plant Community (Table 43)

Woodland

Hopeka Soil

Site index for common trees: Singleleaf pinyon—33; Utah juniper—33
Most important native understory plants: Indian ricegrass, bluebunch wheatgrass, black sagebrush

Ados Soil

Site index for common trees: Singleleaf pinyon—30; Utah juniper—30
Most important native understory plants: Indian ricegrass, bluebunch wheatgrass, black sagebrush

Elements of Wildlife Habitat

Suitability of Hopeka soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Solak soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Ados soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Hopeka Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones, erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Solak Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Ados Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Poor—cemented pan, depth to rock
Daily cover for landfill: Poor—cemented pan, depth to rock, small stones
Shallow excavations: Severe—depth to rock
Local roads and streets: Moderate—depth to rock, slope, frost action

TABLE 43.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Hopeka	Solak	Ados	1	2	3
Indian ricegrass	ORHY	X	5-15	X	---	5-10	X
Pine bluegrass	POSC	X	2-5	X	---	2-5	X
Bluebunch wheatgrass	AGSP	X	1-3	X	---	5-10	X
Thurber needlegrass	STTH2	X	---	X	---	20-30	X
Bottlebrush squirreltail	SIHY	X	---	X	---	---	X
Sandberg bluegrass	POSE	X	---	X	---	2-5	X
Black sagebrush	ARARN	X	20-25	X	---	---	---
Needleandthread	STCO4	---	5-15	---	---	2-5	X
Western wheatgrass	AGSM	---	---	---	---	1-2	---
Nevada bluegrass	PONE3	---	---	---	---	---	X
Other perennial grasses	PPGG	X	5-10	X	---	5-8	X
Tapertip hawksbeard	CRAC2	---	---	---	---	2-5	---
Arrowleaf balsamroot	BASA3	---	---	---	---	2-5	---
Lupine	LUPIN	---	---	---	---	2-5	---
White stoneseed	LIRU4	---	---	---	---	1-5	---
Other perennial forbs	PPFF	X	5-15	X	---	---	X
Annual forbs	AAFF	---	---	---	---	2-5	---
Utah juniper	JUOS	X	---	X	---	---	X
Singleleaf pinyon	PIMO	X	---	X	---	---	X
Fourwing saltbush	ATCA2	---	2-5	---	---	---	---
Bud sagebrush	ARSP5	---	2-5	---	---	---	---
Big sagebrush	ARTR2	---	---	---	---	10-15	X
Rabbitbrush	CHRYS9	---	---	---	---	2-5	---
Antelope bitterbrush	PUTR2	---	---	---	---	1-10	---
Other shrubs	SSSS	X	10-20	X	---	5-10	X
Range site symbol		---	028B016N	---	BARREN	028B007N	---
Woodland site symbol		025X063N	---	025X063N	---	---	025X062N
Potential production (lb/acre):							
Favorable years		400	500	400	---	1,000	500
Normal years		300	250	300	---	800	300
Unfavorable years		200	150	200	---	600	250

Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Hopeka soil—VIIs, nonirrigated; Solak soil—VIIs, nonirrigated; Ados soil—VIs, nonirrigated
Range site symbol: Solak soil—028B016N

Woodland suitability group: Hopeka soil—3r; Ados soil—3d

331—Hopeka-Solak-Rock outcrop association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 6,500 to 7,500 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Hopeka very gravelly loam, 8 to 15 percent slopes (Lithic Xeric Torriorthents - loamy-skeletal, carbonatic, frigid)—40 percent
Solak very gravelly loam, 8 to 30 percent slopes (Lithic Xeric Torriorthents - loamy-skeletal, mixed (calcareous), frigid)—35 percent
Rock outcrop—10 percent
Contrasting inclusions as follows:
Inclusion 1: Umil loam, 2 to 8 percent slopes (Xerollic Durorthids - loamy, mixed, frigid, shallow)—10 percent
Inclusion 2: Aridic Haploxerolls, 0 to 4 percent slopes—3 percent
Inclusion 3: Xeric Torriorthents, 2 to 8 percent slopes (Xeric Torriorthents - loamy-skeletal, carbonatic, frigid)—2 percent

Hopeka Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—limestone, dolostone
Slope features: Length—short; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, black sagebrush, mountainmahogany, Indian ricegrass
Typical profile:
0 to 9 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2
9 inches—unweathered bedrock
Range in depth to bedrock: 4 to 10 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 0.2 to 0.7 inch
Water supplying capacity: 6 to 8 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—1; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Solak Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—siliceous shale, tuff, chert
Slope features: Length—short; shape—convex
Dominant present vegetation: Black sagebrush, needleandthread, bud sagebrush
Typical profile:
0 to 10 inches—very gravelly loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2, A-4
10 inches—unweathered bedrock
Range in depth to bedrock: 10 to 14 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 0.7 to 1.3 inches
Water supplying capacity: 7 to 9 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.05; T value—1; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Rock Outcrop

Positions on landscape: Crests of mountains
Slope features: Length—short; shape—convex
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1: Position on landscape—adjacent fan piedmonts; contrasting feature—silica-cemented hardpan at a depth of 7 to 14 inches; distinctive present vegetation—black sagebrush, Indian ricegrass
Inclusion 2: Position on landscape—drainageways; contrasting features—very deep, nongravelly; distinctive present vegetation—big sagebrush, Thurber needlegrass

Inclusion 3: Position on landscape—alluvial fans at the mouth of drainageways; contrasting feature—very deep; distinctive present vegetation—black sagebrush, bud sagebrush, Indian ricegrass, needleandthread

Major Uses

Rangeland, woodland, wildlife habitat

Potential Native Plant Community (Table 44)

TABLE 44.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Hopeka	Solak	Rock outcrop	1	2	3
Indian ricegrass	ORHY	X	5-15	---	15-25	5-10	15-25
Pine bluegrass	POSC	X	2-5	---	---	2-5	---
Bluebunch wheatgrass	AGSP	X	1-3	---	2-5	5-10	2-5
Thurber needlegrass	STTH2	X	---	---	---	20-30	---
Bottlebrush squirreltail	SIHY	X	---	---	---	---	---
Sandberg bluegrass	POSE	X	---	---	---	2-5	---
Black sagebrush	ARARN	X	20-25	---	20-30	---	20-30
Needleandthread	STCO4	---	5-15	---	5-10	2-5	5-10
Basin wildrye	ELCI2	---	---	---	2-5	---	2-5
Western wheatgrass	AGSM	---	---	---	---	1-2	---
Other perennial grasses	PPGG	X	5-10	---	10-20	5-8	10-20
Tapertip hawksbeard	CRAC2	---	---	---	---	2-5	---
Arrowleaf balsamroot	BASA3	---	---	---	---	2-5	---
Lupine	LUPIN	---	---	---	---	2-5	---
White stoneseed	LIRU4	---	---	---	---	1-5	---
Other perennial forbs	PPFF	X	5-15	---	5-10	---	5-10
Annual forbs	AAFF	---	---	---	---	2-5	---
Utah juniper	JUOS	X	---	---	---	---	---
Singleleaf pinyon	PIMO	X	---	---	---	---	---
Fourwing saltbush	ATCA2	---	2-5	---	---	---	---
Bud sagebrush	ARSP5	---	2-5	---	2-5	---	2-5
Winterfat	EULA5	---	---	---	5-10	---	5-10
Small rabbitbrush	CHVIS	---	---	---	2-5	---	2-5
Big sagebrush	ARTR2	---	---	---	---	10-15	---
Rabbitbrush	CHRYS9	---	---	---	---	2-5	---
Antelope bitterbrush	PUTR2	---	---	---	---	1-10	---
Other shrubs	SSSS	X	10-20	---	10-20	5-10	10-20
Range site symbol		---	028B016N	BARREN	028B011N	028B007N	028B011N
Woodland site symbol		025X063N	---	---	---	---	---
Potential production (lb/acre):							
Favorable years		400	500	---	900	1,000	900
Normal years		300	250	---	700	800	700
Unfavorable years		200	150	---	400	600	400

Woodland

Hopeka Soil

Site index for common trees: Singleleaf pinyon—33; Utah juniper—33
Most important native understory plants: Indian ricegrass, bluebunch wheatgrass, black sagebrush

Elements of Wildlife Habitat

Suitability of Hopeka soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Solak soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Hopeka Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones, depth to rock
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock
Shallow excavations: Severe—depth to rock
Local roads and streets: Severe—depth to rock
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Solak Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site symbol: Solak soil—028B016N
Woodland suitability group: Hopeka soil—3d

332—Hopeka-Cavehill association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 6,500 to 7,600 feet
Climatic data (average annual):
Precipitation—about 13 inches
Air temperature—about 43 degrees F
Frost-free season—about 70 days

Composition

Hopeka very gravelly loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents - loamy-skeletal, carbonatic, frigid)—55 percent
Cavehill bouldery silt loam, 15 to 50 percent slopes (Typic Calcixerolls - loamy-skeletal, carbonatic, frigid)—30 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—5 percent
Inclusion 2: Lithic Haploxerolls, 15 to 50 percent slopes (Lithic Haploxerolls - loamy-skeletal, mixed, frigid)—4 percent
Inclusion 3: Typic Argixerolls, 15 to 30 percent slopes (Typic Argixerolls - fine, montmorillonitic, frigid)—3 percent
Inclusion 4: Aridic Calcixerolls, 15 to 50 percent slopes (Aridic Calcixerolls - loamy-skeletal, mixed, frigid)—3 percent

Hopeka Soil

Positions on landscape: South-, east-, and west-facing side slopes of mountains
Parent material: Kind—residuum; source—limestone, dolostone
Slope features: Length—short; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, black sagebrush, mountainmahogany, Indian ricegrass
Typical profile:
0 to 9 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2
9 inches—unweathered bedrock
Range in depth to bedrock: 4 to 10 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 0.2 to 0.7 inch
Water supplying capacity: 6 to 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Cavehill Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—colluvium over residuum; source—limestone, dolostone
Slope features: Length—short; shape—slightly concave
Dominant present vegetation: Singleleaf pinyon, big sagebrush, Idaho fescue
Typical profile:
0 to 9 inches—bouldery silt loam; 10 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); granular structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC, CL-ML, CL; estimated AASHTO classification - A-4
9 to 18 inches—very gravelly silt loam, very cobbly loam; 10 to 45 percent cobbles and stones and 35 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2, A-4
18 to 29 inches—gravelly loam, very gravelly loam; 10 to 15 percent cobbles and stones and 35 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2, A-4
29 inches—unweathered bedrock
Range in depth to bedrock: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 2.3 to 5.4 inches
Water supplying capacity: 11 to 14 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.28; T value—2; wind erodibility group—8
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low

Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex shoulders of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Inclusion 2: Position on landscape—convex side slopes of mountains, near areas of Rock outcrop; contrasting feature—bedrock at a depth of 10 to 20 inches; distinctive present vegetation—singleleaf pinyon, big sagebrush, Idaho fescue

Inclusion 3: Position on landscape—concave lower part of side slopes of mountains; contrasting features—deep, clayey middle layer; distinctive present vegetation—singleleaf pinyon, big sagebrush, Idaho fescue

Inclusion 4: Position on landscape—smooth lower side slopes of mountains; contrasting feature—deep or very deep; distinctive present vegetation—mountain big sagebrush, Idaho fescue, bluebunch wheatgrass

Major Uses

Rangeland, woodland, wildlife habitat

Potential Native Plant Community (Table 45)

Woodland

Hopeka Soil

Site index for common trees: Singleleaf pinyon—33; Utah juniper—33

Most important native understory plants: Bluebunch wheatgrass, ricegrass, black sagebrush

Cavehill Soil

Site index for common trees: Singleleaf pinyon—35

Most important native understory plants: Bluebunch wheatgrass, Idaho fescue, mountain big sagebrush

Elements of Wildlife Habitat

Suitability of Hopeka soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Suitability of Cavehill soil for named elements:
Wild herbaceous plants (nonirrigated)—good
Coniferous plants (nonirrigated)—good
Shrubs (nonirrigated)—good

Ratings for Selected Uses

Hopeka Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones, erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Cavehill Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIs, nonirrigated
Woodland suitability group: 3r

TABLE 45.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Hopeka	Cavehill	1	2	3	4
Indian ricegrass	ORHY	X	X	---	X	X	---
Pine bluegrass	POSC	X	X	---	X	X	---
Bluebunch wheatgrass	AGSP	X	X	---	X	X	15-30
Thurber needlegrass	STTH2	X	X	---	X	X	T-10
Bottlebrush squirreltail	SIHY	X	X	---	X	X	---
Sandberg bluegrass	POSE	X	X	---	X	X	---
Black sagebrush	ARARN	X	---	---	---	---	---
Needleandthread	STCO4	---	X	---	X	X	---
Nevada bluegrass	PONE3	---	X	---	X	X	2-5
Idaho fescue	FEID	---	---	---	---	---	15-40
Basin wildrye	ELCI2	---	---	---	---	---	5-10
Other perennial grasses	PPGG	X	X	---	X	X	5-10
Hawksbeard	CREPI	---	---	---	---	---	1-5
Arrowleaf balsamroot	BASA3	---	---	---	---	---	5-10
Other perennial forbs	PPFF	X	X	---	X	X	5-15
Utah juniper	JUOS	X	X	---	X	X	---
Singleleaf pinyon	PIMO	X	X	---	X	X	---
Big sagebrush	ARTR2	---	X	---	X	X	---
Antelope bitterbrush	PUTR2	---	---	---	---	---	5-15
Mountain big sagebrush	ARTRV	---	---	---	---	---	10-15
Other shrubs	SSSS	X	X	---	X	X	5-15
Range site symbol		---	---	BARREN	---	---	025XO12N
Woodland site symbol		025XO63N	025XO62N	---	025XO62N	025XO62N	---
Potential production (lb/acre):							
Favorable years		400	500	---	500	500	1,200
Normal years		300	300	---	300	300	900
Unfavorable years		200	250	---	250	250	600

341—Tenvorrd-Kodra association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 5,100 to 6,200 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 49 degrees F
Frost-free season—about 100 days

Composition

Tenvorrd silt loam, 4 to 15 percent slopes (Xerollic Durorthids - loamy, mixed, mesic, shallow)—45 percent
Kodra loam, 2 to 8 percent slopes (Haploxerollic Durorthids - coarse-loamy, mixed, mesic)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Durixerollic Camborthids, 2 to 15 percent slopes (Durixerollic Camborthids - fine-silty, mixed, mesic)—8 percent
Inclusion 2: Xerollic Durorthids, 15 to 30 percent slopes, eroded (Xerollic Durorthids - loamy, mixed, mesic, shallow)—7 percent

Tenvorrd Soil

Positions on landscape: Erosional fan piedmont remnants
Parent material: Kind—alluvium; source—basalt, rhyolite, and siltstone influenced by loess and volcanic ash
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Wyoming big sagebrush, Douglas rabbitbrush, Sandberg bluegrass, invasion of Utah juniper
Typical profile:
0 to 9 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, CL; estimated AASHTO classification - A-4, A-6
9 to 19 inches—loam, silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, CL; estimated AASHTO classification - A-4, A-6
19 to 40 inches or more—indurated hardpan
Range in depth to hardpan: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 3.1 to 3.7 inches
Water supplying capacity: 7 to 8 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.55; T value—1; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Kodra Soil

Positions on landscape: Summits and shoulders of fan piedmont remnants
Parent material: Kind—alluvium; source—basalt, rhyolite, and other siliceous rocks influenced by volcanic ash
Slope features: Length—short; shape—convex
Dominant present vegetation: Wyoming big sagebrush, mustard, Thurber needlegrass, Sandberg bluegrass, cheatgrass
Typical profile:
0 to 5 inches—loam; 0 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 28 inches—loam, sandy loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-2, A-4
28 to 48 inches—cemented hardpan
48 to 60 inches or more—stratified sand to silty clay; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
Range in depth to hardpan: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 3.8 to 4.8 inches
Water supplying capacity: 7 to 10 inches
Runoff: Slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.43; T value—2; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low

Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans near lower side slopes of fan piedmont remnants; contrasting features—very deep, silty, does not have a silica-cemented hardpan; distinctive present vegetation—Wyoming big sagebrush, Douglas rabbitbrush, Sandberg bluegrass, invasion of Utah juniper

Inclusion 2: Position on landscape—eroded side slopes of fan piedmont remnants; contrasting features—slopes of more than 15 percent, thin upper layer; distinctive present vegetation—Wyoming big sagebrush, Douglas rabbitbrush, Sandberg bluegrass, invasion of Utah juniper

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 46)

Elements of Wildlife Habitat

Suitability of Tenvorrd soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Kodra soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Tenvorrd Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty, erodes easily
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Severe—cemented pan

TABLE 46.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Tenvorrd	Kodra	1	2
Bluebunch wheatgrass	AGSP	10-40	10-40	10-40	10-40
Thurber needlegrass	STTH2	10-40	10-40	10-40	10-40
Basin wildrye	ELCI2	5-15	5-15	5-15	5-15
Indian ricegrass	ORHY	2-10	2-10	2-10	2-10
Webber ricegrass	ORWE	2-10	2-10	2-10	2-10
Bluegrass	POA++	2-10	2-10	2-10	2-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10
Perennial forbs	PPFF	5-10	5-10	5-10	5-10
Big sagebrush	ARTR2	10-15	10-15	10-15	10-15
Other shrubs	SSSS	5-15	5-15	5-15	5-15
Range site symbol		025X019N	025X019N	025X019N	025X019N
Potential production (lb/acre):					
Favorable years		800	800	800	800
Normal years		600	600	600	600
Unfavorable years		400	400	400	400

Pond reservoir areas: Severe—cemented pan, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Kodra Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Moderate—cemented pan, frost action
Pond reservoir areas: Moderate—seepage, cemented pan, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Tenvorrd soil—IVe, irrigated, and VIIs, nonirrigated; Kodra soil—IIIe, irrigated, and VIs, nonirrigated
Range site symbol: 025X019N

350—Fenster silt loam

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 6,000 to 6,600 feet
Climatic data (average annual):
Precipitation—about 8 inches
Air temperature—about 45 degrees F
Frost-free season—about 85 days

Composition

Fenster silt loam, 0 to 2 percent slopes (Typic Torriorthents - fine-silty, mixed (calcareous), frigid)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Poorcal loam, 0 to 4 percent slopes (Durixerollic Calciorthids - coarse-loamy, mixed, frigid)—10 percent
Inclusion 2: Bubus loam, 0 to 2 percent slopes (Durorthidic Torriorthents - coarse-loamy, mixed (calcareous), mesic)—5 percent

Fenster Soil

Positions on landscape: Inset fans
Parent material: Silty alluvium influenced by loess
Slope features: Length—short; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, fourwing saltbush, Indian ricegrass, rabbitbrush
Typical profile:
0 to 6 inches—silt loam; platy structure; soft, friable; very strongly alkaline (pH 9.6); strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6
6 to 13 inches—silt loam, silty clay loam; subangular blocky structure; soft, friable; very strongly alkaline (pH 9.4); strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6, A-7
13 to 60 inches or more—silt loam, silty clay loam; massive; soft, friable; moderately alkaline (pH 8.0); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6, A-7
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 11.0 to 12.5 inches
Water supplying capacity: 6 to 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—remnants of inset fans; contrasting features—layer of lime accumulation at a depth of 8 to 20 inches, weak silica cementation; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass
Inclusion 2: Position on landscape—remnants of alluvial flats adjacent to inset fans; contrasting feature—weak silica cementation; distinctive present vegetation—black greasewood, shadscale

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 47)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess salt, excess sodium, too crusty
Roadfill: Fair—shrink-swell
Daily cover for landfill: Poor—excess sodium
Shallow excavations: Slight
Local roads and streets: Moderate—frost action, shrink-swell
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, excess sodium, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IVs, irrigated, and VIIs, nonirrigated
Range site symbol: 028B017N

TABLE 47.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Fenster	1	2
Bottlebrush squirreltail	SIHY	2-5	5-10	7-10
Needleandthread	STC04	5-10	10-20	---
Indian ricegrass	ORHY	5-10	20-30	---
Sandberg bluegrass	POSE	---	2-5	---
Inland saltgrass	DIST	---	---	T-2
Basin wildrye	ELCI2	---	---	T-2
Other perennial grasses	PPGG	5-10	5-10	---
Miterwort	NITRO	---	---	2-3
Other perennial forbs	PPFF	5-10	2-5	T-3
Shadscale	ATCO	30-40	---	30-40
Bud sagebrush	ARSP5	5-10	---	5-10
Fourwing saltbush	ATCA2	3-5	---	---
Winterfat	EULA5	2-5	---	---
Wyoming big sagebrush	ARTRW*	---	15-20	---
Black greasewood	SAVE4	---	---	20-30
Seepweed	SUAED	---	---	5-15
Other shrubs	SSSS	5-15	5-10	---
Range site symbol		028B017N	028B010N	024X003N
Potential production (lb/acre):				
Favorable years		700	800	600
Normal years		500	600	450
Unfavorable years		250	400	300

351—Fenster silt loam, nonsaline-alkali, frequently flooded

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 6,000 to 6,500 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 85 days

Composition

Fenster silt loam, nonsaline-alkali, frequently flooded, 0 to 2 percent slopes (Typic Torriorthents - fine-silty, mixed (calcareous), frigid)—90 percent
Contrasting inclusions as follows:
Inclusion 1: Silverado sandy loam, 0 to 4 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, frigid)—5 percent
Inclusion 2: Jesse Camp silt loam, 0 to 2 percent slopes (Xerollic Camborthids - fine-silty, mixed, frigid)—3 percent
Inclusion 3: Xeric Torriorthents silt loam, gullied, 0 to 2 percent slopes (Xeric Torriorthents - fine-silty, mixed (calcareous), frigid)—2 percent

Fenster Soil

Positions on landscape: Inset fans
Parent material: Silty alluvium influenced by loess
Slope features: Length—short; shape—smooth
Dominant present vegetation: Winterfat, Indian ricegrass, bottlebrush squirreltail, bud sagebrush
Typical profile:
0 to 6 inches—silt loam; platy structure; soft, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6
6 to 13 inches—silt loam, silty clay loam; subangular blocky structure; soft, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6, A-7
13 to 60 inches or more—silt loam, silty clay loam; massive; soft, friable; moderately alkaline (pH 8.0); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6, A-7
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Frequency—frequent; duration—very brief; months—December through May
Permeability: Moderate
Available water capacity: 11.0 to 12.5 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—fan skirts; contrasting features—moderately coarse textured throughout the profile, weak silica cementation; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass
Inclusion 2: Position on landscape—upper part of inset fans; contrasting feature—receives additional moisture from runoff; distinctive present vegetation—basin big sagebrush, rabbitbrush, basin wildrye
Inclusion 3: Position on landscape—areas adjacent to channels; contrasting feature—receives additional moisture from runoff; distinctive present vegetation—big sagebrush, rabbitbrush, basin wildrye

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 48)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, excess salt
Roadfill: Fair—shrink-swell
Daily cover for landfill: Good
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 48.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Fenster	1	2	3
Indian ricegrass	ORHY	15-25	---	20-30	2-5
Bottlebrush squirreltail	SIHY	2-5	---	5-10	2-5
Basin wildrye	ELCI2	---	30-50	---	10-20
Wheatgrass	AGROP2	---	2-5	---	---
Nevada bluegrass	PONE3	---	2-5	---	---
Needleandthread	STCO4	---	---	10-20	2-5
Sandberg bluegrass	POSE	---	---	2-5	---
Other perennial grasses	PPGG	5-10	15-25	5-10	5-10
Perennial forbs	PPFF	5-10	2-5	2-5	5-10
Fourwing saltbush	ATCA2	1-2	---	---	2-5
Winterfat	EULA5	30-45	---	---	---
Basin big sagebrush	ARTRT*	---	5-10	---	10-15
Wyoming big sagebrush	ARTRW*	---	1-2	15-20	---
Rabbitbrush	CHRYS9	---	---	---	2-5
Nevada ephedra	EPNE	---	---	---	2-5
Other shrubs	SSSS	5-15	5-8	5-10	5-10
Range site symbol		028B013N	028B003N	028B010N	028B009N
Potential production (lb/acre):					
Favorable years		800	2,600	800	700
Normal years		600	1,250	600	400
Unfavorable years		300	800	400	300

Interpretive Groups

Range site symbol: 028B013N

Capability classification: IIIw, irrigated, and VIw, nonirrigated

352—Fenster-Jesse Camp association

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 6,000 to 6,600 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 45 degrees F
Frost-free season—about 85 days

Composition

Fenster silt loam, nonsaline-alkali, frequently flooded, 0 to 2 percent slopes (Typic Torriorthents - fine-silty, mixed (calcareous), frigid)—45 percent
Jesse Camp silt loam, 0 to 2 percent slopes (Xerollic Camborthids - fine-silty, mixed, frigid) —40 percent
Contrasting inclusions as follows:
Inclusion 1: Hayeston sandy loam, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—10 percent
Inclusion 2: Durixerollic Camborthids, 0 to 4 percent slopes—4 percent
Inclusion 3: Xeric Torriorthents silt loam, gullied, 0 to 2 percent slopes (Xeric Torriorthents - fine-silty, mixed (calcareous), frigid)—1 percent

Fenster Soil

Positions on landscape: Inset fans
Parent material: Silty alluvium influenced by loess
Slope features: Length—short; shape—smooth
Dominant present vegetation: Winterfat, Indian ricegrass, bottlebrush squirreltail, bud sagebrush
Typical profile:
0 to 6 inches—silt loam; platy structure; soft, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6
6 to 13 inches—silt loam, silty clay loam; subangular blocky structure; soft, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6, A-7
13 to 60 inches or more—silt loam, silty clay loam; massive; soft, friable; moderately alkaline (pH 8.0); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6, A-7
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Frequency—frequent; duration—very brief; months—December through May
Permeability: Moderate
Available water capacity: 11.0 to 12.5 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Moderate

Jesse Camp Soil

Positions on landscape: Inset fans
Parent material: Silty alluvium influenced by volcanic ash
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Basin big sagebrush, rabbitbrush, basin wildrye
Typical profile:
0 to 10 inches—silt loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - ML; estimated AASHTO classification - A-4
10 to 60 inches or more—silt loam; massive; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Moderately slow
Available water capacity: 10 to 12 inches
Water supplying capacity: 8 to 11 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—upper edges of inset fans; contrasting feature—coarser textured throughout the profile; distinctive present vegetation—big sagebrush, Thurber needlegrass, bottlebrush squirreltail
Inclusion 2: Position on landscape—lower side slopes of adjacent fan piedmonts; contrasting feature—weak silica cementation; distinctive present

vegetation—black sagebrush, Indian ricegrass, bud sagebrush
Inclusion 3: Position on landscape—areas adjacent to channels; contrasting feature—severely eroded areas; distinctive present vegetation—big sagebrush, rabbitbrush, basin wildrye

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 49)

Elements of Wildlife Habitat

Suitability of Fenster soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor
Suitability of Jesse Camp soil for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair

TABLE 49.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Fenster	Jesse Camp	1	2	3
Indian ricegrass	ORHY	15-25	---	20-30	15-25	2-5
Bottlebrush squirreltail	SIHY	2-5	---	5-10	---	2-5
Basin wildrye	ELCI2	---	30-50	---	2-5	10-20
Wheatgrass	AGROP2	---	2-5	---	---	---
Nevada bluegrass	PONE3	---	2-5	---	---	---
Needleandthread	STCO4	---	---	10-20	5-10	2-5
Sandberg bluegrass	POSE	---	---	2-5	---	---
Bluebunch wheatgrass	AGSP	---	---	---	2-5	---
Other perennial grasses	PPGG	5-10	15-25	5-10	10-20	5-10
Perennial forbs	PPFF	5-10	2-5	2-5	5-10	5-10
Fourwing saltbush	ATCA2	1-2	---	---	---	2-5
Winterfat	EULA5	30-45	---	---	5-10	---
Basin big sagebrush	ARTRT*	---	5-10	---	---	10-15
Wyoming big sagebrush	ARTRW*	---	1-2	15-20	---	---
Black sagebrush	ARARN	---	---	---	20-30	---
Bud sagebrush	ARSP5	---	---	---	2-5	---
Small rabbitbrush	CHVIS	---	---	---	2-5	---
Rabbitbrush	CHRYS9	---	---	---	---	2-5
Nevada ephedra	EPNE	---	---	---	---	2-5
Other shrubs	SSSS	5-15	5-8	5-10	10-20	5-10

Range site symbol	028B013N	028B003N	028B010N	028B011N	028B009N
Potential production (lb/acre):					
Favorable years	800	2,600	800	900	700
Normal years	600	1,250	600	700	400
Unfavorable years	300	800	400	400	300

Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Fenster Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, excess salt
Roadfill: Fair—shrink-swell
Daily cover for landfill: Good
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Jesse Camp Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Fair—low strength, shrink-swell
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Severe—frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Fenster soil—IIIw, irrigated, and VIw, nonirrigated; Jesse Camp soil—IIc, irrigated, and VIc, nonirrigated
Range site symbol: Fenster soil—028B013N; Jesse Camp soil—028B003N

353—Fenster-Jesse Camp association, alkali

Map Unit Setting

Positions on landscape: Inset fans, flood plains
Elevation: 6,200 to 6,800 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 45 degrees F
Frost-free season—about 85 days

Composition

Fenster silt loam, 0 to 2 percent slopes (Typic Torriorthents - fine-silty, mixed (calcareous), frigid)—50 percent
Jesse Camp silt loam, occasionally flooded, 0 to 2 percent slopes (Xerollic Camborthids - fine-silty, mixed, frigid)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Kobeh gravelly loam, 0 to 4 percent slopes (Durixerollic Camborthids - loamy-skeletal, mixed, frigid)—4 percent
Inclusion 2: Durorthidic Torriorthents loam, 0 to 4 percent slopes (Durorthidic Torriorthents - coarse-loamy, mixed (calcareous), frigid)—3 percent
Inclusion 3: Dianev silt loam, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), frigid)—3 percent

Fenster Soil

Positions on landscape: Margins of inset fans or flood plains
Parent material: Silty alluvium influenced by loess
Slope features: Length—short; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, fourwing saltbush, Indian ricegrass, rabbitbrush
Typical profile:
0 to 6 inches—silt loam, sandy loam; platy structure; soft, friable; very strongly alkaline (pH 9.6); strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6
6 to 13 inches—silt loam, silty clay loam; subangular blocky structure; soft, friable; very strongly alkaline (pH 9.4); strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6, A-7
13 to 60 inches or more—silt loam, silty clay loam; massive; soft, friable; moderately alkaline (pH 8.0); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 10 to 25); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6, A-7
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 11.0 to 12.5 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: Moderate

Jesse Camp Soil

Positions on landscape: Central parts of inset fans or flood plains
Parent material: Silty alluvium influenced by volcanic ash
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Basin big sagebrush, rabbitbrush, basin wildrye
Typical profile:
0 to 10 inches—silt loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - ML; estimated AASHTO classification - A-4
10 to 60 inches or more—silt loam; massive; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Frequency—occasional; duration—brief; months—March through June
Permeability: Moderately slow
Available water capacity: 10 to 12 inches
Water supplying capacity: 8 to 11 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—higher areas of inset fans; contrasting features—very gravelly throughout the profile, weak silica cementation; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass

Inclusion 2: Position on landscape—stream terraces; contrasting feature—coarser textured throughout the profile; distinctive present vegetation—black greasewood, shadscale

Inclusion 3: Position on landscape—flood plains along channels; contrasting feature—wetness; distinctive present vegetation—alkali sacaton, inland saltgrass, basin wildrye

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 50)

TABLE 50.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Fenster	Jesse Camp	1	2	3
Bottlebrush squirreltail	SIHY	2-5	2-5	5-10	7-10	---
Needleandthread	STCO4	5-10	2-5	10-20	---	---
Indian ricegrass	ORHY	5-10	2-5	20-30	---	---
Basin wildrye	ELCI2	---	10-20	---	T-2	5-15
Sandberg bluegrass	POSE	---	---	2-5	---	---
Inland saltgrass	DIST	---	---	---	T-2	5-10
Alkali sacaton	SPAI	---	---	---	---	20-30
Other perennial grasses	PPGG	5-10	5-10	5-10	---	10-20
Miterwort	NITRO	---	---	---	2-3	---
Other perennial forbs	PPFF	5-10	5-10	2-5	T-3	5-10
Shadscale	ATCO	30-40	---	---	30-40	---
Bud sagebrush	ARSP5	5-10	---	---	5-10	---
Fourwing saltbush	ATCA2	3-5	2-5	---	---	2-5
Winterfat	EULA5	2-5	---	---	---	---
Basin big sagebrush	ARTRT*	---	10-15	---	---	2-5
Rabbitbrush	CHRYS9	---	2-5	---	---	---
Nevada ephedra	EPNE	---	2-5	---	---	---
Wyoming big sagebrush	ARTRW*	---	---	15-20	---	---
Black greasewood	SAVE4	---	---	---	20-30	5-10
Seepweed	SUAED	---	---	---	5-15	---
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5
Other shrubs	SSSS	5-15	5-10	5-10	---	2-5

Range site symbol	028B017N	028B009N	028B010N	024X003N	028B004N
Potential production (lb/acre):					
Favorable years	700	700	800	600	2,000
Normal years	500	400	600	450	1,000
Unfavorable years	250	300	400	300	500

Elements of Wildlife Habitat

Suitability of Fenster soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Suitability of Jesse Camp soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Fenster Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess salt, excess sodium, too crusty
Roadfill: Fair—shrink-swell
Daily cover for landfill: Poor—excess sodium
Shallow excavations: Slight
Local roads and streets: Moderate—frost action, shrink-swell
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, excess sodium, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Jesse Camp Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Fair—low strength, shrink-swell
Daily cover for landfill: Good
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding, frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Fenster soil—IVs, irrigated, and VIIs, nonirrigated; Jesse Camp soil—IIw, irrigated, and VIw, nonirrigated
Range site symbol: Fenster soil—028B017N; Jesse Camp soil—028B009N

361—Loncan Variant loam

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 5,100 to 5,300 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 49 degrees F
Frost-free season—about 100 days

Composition

Loncan Variant loam, 0 to 2 percent slopes (Aridic Duric Haploxerolls - fine-loamy, mixed, mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Durixerollic Camborthids, 0 to 4 percent slopes (Durixerollic Camborthids - fine-loamy, mixed, mesic)—10 percent
Inclusion 2: Durixerollic Camborthids, 4 to 15 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, mesic)—5 percent

Loncan Variant Soil

Positions on landscape: Inset fans
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Basin wildrye, basin big sagebrush, rubber rabbitbrush, Nevada bluegrass
Typical profile:
0 to 5 inches—loam; 0 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, SM; estimated AASHTO classification - A-4
5 to 19 inches—silt loam; 0 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, ML; estimated AASHTO classification - A-4
19 to 48 inches—gravelly loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, SC; estimated AASHTO classification - A-6
48 to 60 inches or more—very gravelly loamy sand; 50 to 65 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Moderately slow
Available water capacity: 7.2 to 8.6 inches
Water supplying capacity: 8 to 11 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.37; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—margins of inset fans; contrasting feature—does not have a thick, dark-colored upper layer; distinctive present vegetation—basin wildrye, basin big sagebrush
Inclusion 2: Position on landscape—side slopes of adjacent fan piedmont remnants; contrasting features—coarser textured profile, slopes of more than 4 percent; distinctive present vegetation—Wyoming big sagebrush, bluebunch wheatgrass

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 51)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Fair—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—flooding, frost action, shrink-swell
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines

TABLE 51.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Loncan Variant	1	2
Basin wildrye	ELCI2	50-60	5-15	50-60
Nevada bluegrass	PONE3	5-10	---	---
Sedge	CAREX	1-5	---	---
Mat muhly	MURI	2-5	---	2-5
Bluebunch wheatgrass	AGSP	---	10-40	---
Thurber needlegrass	STTH2	---	10-40	---
Indian ricegrass	ORHY	---	2-10	---
Webber ricegrass	ORWE	---	2-10	---
Bluegrass	POA++	---	2-10	---
Inland saltgrass	DIST	---	---	2-5
Bottlebrush squirreltail	SIHY	---	---	2-5
Western wheatgrass	AGSM	---	---	5-10
Other perennial grasses	PPGG	15-20	5-10	2-5
Lupine	LUPIN	2-5	---	---
Povertyweed	IVAX	---	---	1-2
Other perennial forbs	PPFF	5-10	5-10	2-3
Basin big sagebrush	ARTRT*	10-15	---	15-20
Rubber rabbitbrush	CHNA2	2-5	---	2-5
Big sagebrush	ARTR2	---	10-15	---
Black greasewood	SAVE4	---	---	2-5
Other shrubs	SSSS	---	5-15	2-4
Range site symbol		025X003N	025X019N	024X006N
Potential production (lb/acre):				
Favorable years		2,500	800	1,500
Normal years		1,900	600	1,100
Unfavorable years		1,200	400	600

Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIIs, irrigated, and VIc, nonirrigated

Range site symbol: 025X003N

370—Kobeh gravelly loam, 0 to 2 percent slopes

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 6,000 to 6,600 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Kobeh gravelly loam, 0 to 2 percent slopes (Durixerollic Camborthids - loamy-skeletal, mixed, frigid)—90 percent
Contrasting inclusions as follows:
Inclusion 1: Bubus loam, 0 to 4 percent slopes (Durorthidic Torriorthents - coarse-loamy, mixed (calcareous), mesic)—5 percent
Inclusion 2: Jesse Camp silt loam (Xerollic Camborthids - fine-silty, mixed, frigid)—5 percent

Kobeh Soil

Positions on landscape: Inset fans
Parent material: Mixed alluvium influenced by volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, Indian ricegrass, small rabbitbrush, bottlebrush squirreltail
Typical profile:
0 to 7 inches—gravelly loam; 25 to 35 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
7 to 15 inches—gravelly sandy loam, gravelly fine sandy loam; 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-1, A-2
15 to 60 inches or more—stratified gravelly fine sandy loam to very gravelly sand; 50 to 65 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GP-GM, GM, SP-SM, SM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 4.5 to 6.0 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—basin floor remnants at terminus of inset fans; contrasting features—nongravelly throughout the profile, saline-alkali affected; distinctive present vegetation—black greasewood, shadscale
Inclusion 2: Position on landscape—central parts of inset fans near shallow drainageways; contrasting features—nongravelly, silty throughout the profile, does not have silica cementation, receives additional moisture from runoff; distinctive present vegetation—basin big sagebrush, basin wildrye

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 52)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—very poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

TABLE 52.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Kobeh	1	2
Indian ricegrass	ORHY	20-30	---	---
Needleandthread	STCO4	10-20	---	---
Bottlebrush squirreltail	SIHY	5-10	7-10	---
Sandberg bluegrass	POSE	2-5	---	---
Inland saltgrass	DIST	---	T-2	---
Basin wildrye	ELCI2	---	T-2	30-50
Wheatgrass	AGROP2	---	---	2-5
Nevada bluegrass	PONE3	---	---	2-5
Other perennial grasses	PPGG	5-10	---	15-25
Miterwort	NITRO	---	2-3	---
Other perennial forbs	PPFF	2-5	T-3	2-5
Wyoming big sagebrush	ARTRW*	15-20	---	1-2
Shadscale	ATCO	---	30-40	---
Bud sagebrush	ARSP5	---	5-10	---
Black greasewood	SAVE4	---	20-30	---
Seepweed	SUAED	---	5-15	---
Basin big sagebrush	ARTRT*	---	---	5-10
Other shrubs	SSSS	5-10	---	5-8
Range site symbol		028B010N	024X003N	028B003N
Potential production (lb/acre):				
Favorable years		800	600	2,600
Normal years		600	450	1,250
Unfavorable years		400	300	800

Interpretive Groups

Range site symbol: 028B010N

Capability classification: IVs, irrigated, and VIIc, nonirrigated

371—Kobeh-Shipley association

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 6,000 to 6,600 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Kobeh gravelly loam, 0 to 4 percent slopes (Durixerollic Camborthids - loamy-skeletal, mixed, frigid)—60 percent
Shipley fine sandy loam, occasionally flooded, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—30 percent
Contrasting inclusion as follows:
Inclusion 1: Umil loam, 0 to 4 percent slopes (Xerollic Durorthids - loamy, mixed, frigid, shallow)—10 percent

Kobeh Soil

Positions on landscape: Margins of inset fans
Parent material: Mixed alluvium influenced by volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Big sagebrush, rabbitbrush, Indian ricegrass, needleandthread
Typical profile:
0 to 7 inches—gravelly loam; 25 to 35 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
7 to 15 inches—gravelly sandy loam, gravelly fine sandy loam; 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-1, A-2
15 to 60 inches or more—stratified gravelly fine sandy loam to very gravelly sand; 50 to 65 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GP-GM, GM, SP-SM, SM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 4.5 to 6.0 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Shipley Soil

Positions on landscape: Central part of inset fans
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Winterfat, halogeton, Indian ricegrass, bottlebrush squirreltail, bud sagebrush
Typical profile:
0 to 9 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
9 to 41 inches—sandy loam, fine sandy loam; 0 to 10 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - SM; estimated AASHTO classification - A-2
41 to 60 inches or more—stratified gravelly loam to very gravelly sandy loam; 35 to 60 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - GM, SM; estimated AASHTO classification - A-1, A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Frequency—occasional; duration—very brief; months—February through July
Permeability: Moderate
Available water capacity: 6.5 to 8.0 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.37; T value—3; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusion

Inclusion 1: Position on landscape—adjacent fan piedmont remnants; contrasting feature—shallow to silica-cemented hardpan; distinctive present vegetation—black sagebrush, Indian ricegrass, winterfat

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 53)

TABLE 53.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		Inclusion number--
		Kobeh	Shipley	1
Indian ricegrass	ORHY	20-30	15-25	15-25
Needleandthread	STCO4	10-20	---	5-10
Bottlebrush squirreltail	SIHY	5-10	2-5	---
Sandberg bluegrass	POSE	2-5	---	---
Bluebunch wheatgrass	AGSP	---	---	2-5
Basin wildrye	ELCI2	---	---	2-5
Other perennial grasses	PPGG	5-10	5-10	10-20
Perennial forbs	PPFF	2-5	5-10	5-10
Wyoming big sagebrush	ARTRW*	15-20	---	---
Fourwing saltbush	ATCA2	---	1-2	---
Winterfat	EULA5	---	30-45	5-10
Black sagebrush	ARARN	---	---	20-30
Bud sagebrush	ARSP5	---	---	2-5
Small rabbitbrush	CHVIS	---	---	2-5
Other shrubs	SSSS	5-10	5-15	10-20
Range site symbol		028B010N	028B013N	028B011N
Potential production (lb/acre):				
Favorable years		800	800	900
Normal years		600	600	700
Unfavorable years		400	300	400

Elements of Wildlife Habitat

Suitability of Kobeh soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—very poor
Shallow water areas—very poor
Suitability of Shipley soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Kobeh Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Shipley Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Kobeh soil—IVe, irrigated, and VIIc, nonirrigated; Shipley soil—IIIw, irrigated, and VIw, nonirrigated
Range site symbol: Kobeh soil—028B010N; Shipley soil—028B013N

382—Toeja-Puett association

Map Unit Setting

Positions on landscape: Hills
Elevation: 5,100 to 5,300 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 45 degrees F
Frost-free season—about 95 days

Composition

Toeja loam, 15 to 30 percent slopes (Aridic Argixerolls - fine-loamy, mixed, frigid)—40 percent
Toeja loam, 4 to 15 percent slopes (Aridic Argixerolls - fine-loamy, mixed, frigid)—30 percent
Puett fine sandy loam, 15 to 30 percent slopes (Xeric Torriorthents - loamy, mixed (calcareous), mesic, shallow)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Badland—5 percent
Inclusion 2: Singletree very cobbly loam, 30 to 50 percent slopes (Aridic Calcic Argixerolls - fine-loamy, mixed, frigid)—5 percent
Inclusion 3: Loncan Variant loam, 2 to 8 percent slopes (Aridic Duric Haploxerolls - fine-loamy, mixed, mesic)—5 percent

Toeja, Moderately Steep, Soil

Positions on landscape: North-facing upper side slopes of hills
Parent material: Loess high in volcanic ash over residuum derived from tuff
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Bluebunch wheatgrass, bluegrass, big sagebrush, Thurber needlegrass
Typical profile:
0 to 15 inches—loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
15 to 31 inches—sandy clay loam; 0 to 25 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SC, CL; estimated AASHTO classification - A-6
31 to 56 inches—sandy loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC; estimated AASHTO classification - A-4
56 inches—weathered bedrock
Range in depth to bedrock: 48 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 31 inches—moderately slow; below this depth—moderately rapid
Available water capacity: 6.0 to 8.5 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.37; T value—4; wind erodibility group—5
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Toeja, Strongly Sloping, Soil

Positions on landscape: North- and east-facing lower side slopes of hills
Parent material: Loess high in volcanic ash over residuum derived from tuff
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Bluebunch wheatgrass, bluegrass, big sagebrush, basin wildrye
Typical profile:
0 to 15 inches—loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
15 to 31 inches—sandy clay loam; 0 to 25 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SC, CL; estimated AASHTO classification - A-6
31 to 56 inches—sandy loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC; estimated AASHTO classification - A-4
56 inches—weathered bedrock
Range in depth to bedrock: 48 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 31 inches—moderately slow; below this depth—moderately rapid
Available water capacity: 6.0 to 8.5 inches
Water supplying capacity: 10 to 12 inches
Runoff: Medium

Hydrologic group: B
Erosion factors (upper layer): K value—0.37; T value—4; wind erodibility group—5
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Puett Soil

Positions on landscape: South-facing side slopes of hills
Parent material: Kind—residuum; source—tuff
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Indian ricegrass, big sagebrush, bottlebrush squirreltail, basin wildrye
Typical profile:
0 to 5 inches—fine sandy loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
5 to 17 inches—coarse sandy loam, fine sandy loam, sandy loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, ML; estimated AASHTO classification - A-1, A-2, A-4;
17 inches—weathered bedrock
Range in depth to bedrock: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the weathered bedrock—moderately rapid
Available water capacity: 1.3 to 3.0 inches
Water supplying capacity: 7 to 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.28; T value—1; wind erodibility group—3
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—eroded side slopes of hills; contrasting feature—exposed soft geologic material; distinctive present vegetation—barren
Inclusion 2: Position on landscape—upper north-facing side slopes of hills; contrasting feature—layer of lime accumulation at a depth of 30 to 43 inches; distinctive present vegetation—Idaho fescue, antelope bitterbrush
Inclusion 3: Position on landscape—inset fans; contrasting features—very deep, weak silica cementation; distinctive present vegetation—basin big sagebrush, basin wildrye

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 54)

Elements of Wildlife Habitat

Suitability of Toeja, moderately steep, soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Toeja, strongly sloping, soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Puett soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Toeja, Moderately Steep, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—erodes easily
Roadfill: Fair—depth to rock, thin layer, slope
Daily cover for landfill: Poor—slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Toeja, Strongly Sloping, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Good
Roadfill: Fair—frost action, shrink-swell
Daily cover for landfill: Fair—depth to rock, slope, thin layer
Shallow excavations: Moderate—slope
Local roads and streets: Moderate—slope, frost action, shrink-swell
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 54.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Toeja, moderately steep	Toeja, strongly sloping	Puett	1	2
Bluebunch wheatgrass	AGSP	20-30	20-30	---	15-30	---
Thurber needlegrass	STTH2	15-25	15-25	---	T-10	---
Nevada bluegrass	PONE3	2-10	2-10	---	2-5	5-10
Indian ricegrass	ORHY	---	---	10-30	---	---
Bottlebrush squirreltail	SIHY	---	---	5-10	---	---
Idaho fescue	FEID	---	---	---	15-40	---
Basin wildrye	ELCI2	---	---	---	5-10	50-60
Sedge	CAREX	---	---	---	---	1-5
Mat muhly	MURI	---	---	---	---	2-5
Other perennial grasses	PPGG	10-15	10-15	10-20	5-10	15-20
Hawksbeard	CREPI	---	---	---	1-5	---
Arrowleaf balsamroot	BASA3	---	---	---	5-10	---
Lupine	LUPIN	---	---	---	---	2-5
Other perennial forbs	PPFF	2-5	2-5	---	5-15	5-10
Big sagebrush	ARTR2	10-15	10-15	---	---	---
Douglas rabbitbrush	CHVI8	5-10	5-10	---	---	---
Black sagebrush	ARARN	---	---	5-15	---	---
Wyoming big sagebrush	ARTRW*	---	---	10-25	---	---
Antelope bitterbrush	PUTR2	---	---	---	5-15	---
Mountain big sagebrush	ARTRV	---	---	---	10-15	---
Basin big sagebrush	ARTRT*	---	---	---	---	10-15
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5
Other shrubs	SSSS	---	---	2-5	5-15	---
Range site symbol		025X014N	025X014N	025X025N	025X012N	025X003N
Potential production (lb/acre):						
Favorable years		1,000	1,000	200	1,200	2,500
Normal years		800	800	150	900	1,900
Unfavorable years		600	600	100	600	1,200

Puett Soil

Suitability and limitations for the following uses:

Rangeland seeding: Poor—droughty

Roadfill: Poor—depth to rock

Daily cover for landfill: Poor—depth to rock, slope

Shallow excavations: Severe—depth to rock, slope

Local roads and streets: Severe—slope

Pond reservoir areas: Severe—depth to rock, slope

Embankments, dikes, and levees: Severe—piping

Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Toeja, moderately steep, soil—VIe, nonirrigated; Toeja, strongly sloping, soil—IIIe, irrigated, and VIc, nonirrigated; Puett soil—VIIe, nonirrigated

Range site symbol: Toeja, moderately steep, soil—025X014N; Toeja, strongly sloping, soil—025X014N; Puett soil—025X025N

392—Lopwash loam, 0 to 4 percent slopes

Map Unit Setting

Positions on landscape: Fan skirts
Elevation: 6,200 to 6,800 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 45 degrees F
Frost-free season—about 80 days

Composition

Lopwash loam, 0 to 4 percent slopes (Typic Camborthids - loamy-skeletal, mixed, frigid)—95 percent
Contrasting inclusion as follows:
Inclusion 1: Hayeston sandy loam, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—5 percent

Lopwash Soil

Positions on landscape: Lower part of fan skirts
Parent material: Mixed alluvium
Slope features: Length—short; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, Indian ricegrass, winterfat
Typical profile:
0 to 10 inches—loam; 10 to 20 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
10 to 32 inches—very gravelly coarse sandy loam; 60 to 70 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - GM-GC; estimated AASHTO classification - A-1
32 to 60 inches or more—very gravelly loamy sand; 0 to 5 percent cobbles and stones and 55 to 70 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - GP-GM, GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 4.3 to 5.2 inches
Water supplying capacity: 7 to 9 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.37; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusion

Inclusion 1: Position on landscape—smooth, slightly convex inset fans dissecting fan skirts; contrasting feature—receives additional moisture from runoff; distinctive present vegetation—Wyoming big sagebrush, halogeton, Indian ricegrass

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 55)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—seepage
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: IIIe, irrigated, and VIIc, nonirrigated
Range site symbol: 028B017N

TABLE 55.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	Inclusion number--
		Lopwash	1
Bottlebrush squirreltail	SIHY	2-5	5-10
Needleandthread	STCO4	5-10	10-20
Indian ricegrass	ORHY	5-10	20-30
Sandberg bluegrass	POSE	---	2-5
Other perennial grasses	PPGG	5-10	5-10
Perennial forbs	PPFF	5-10	2-5
Shadscale	ATCO	30-40	---
Bud sagebrush	ARSP5	5-10	---
Fourwing saltbush	ATCA2	3-5	---
Winterfat	EULA5	2-5	---
Wyoming big sagebrush	ARTRW*	---	15-20
Other shrubs	SSSS	5-15	5-10
Range site symbol		028B017N	028B010N
Potential production (lb/acre):			
Favorable years		700	800
Normal years		500	600
Unfavorable years		250	400

400—Brinnum silt loam

Map Unit Setting

Positions on landscape: Lake plains
Elevation: 6,150 to 6,300 feet
Climatic data (average annual):
Precipitation—about 8 inches
Air temperature—about 46 degrees F
Frost-free season—about 100 days

Composition

Brinnum silt loam, 0 to 2 percent slopes (Typic Halaquepts - fine-silty, mixed (calcareous), mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Aeric Halaquepts, 0 to 2 percent slopes (Aeric Halaquepts - coarse-loamy, mixed (calcareous), mesic)—6 percent
Inclusion 2: Haplaquolls, 0 to 2 percent slopes—5 percent
Inclusion 3: Bubus loam, 0 to 2 percent slopes (Durorthidic Torriorthents - coarse-loamy, mixed (calcareous), mesic)—4 percent

Brinnum Soil

Positions on landscape: Lake plains
Parent material: Silty alluvium over gravelly and sandy alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Alkali sacaton, alkali muhly, alkali cordgrass, black greasewood
Typical profile:
0 to 6 inches—silt loam; granular structure; soft, very friable; very strongly alkaline (pH 9.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 25 to 40); estimated Unified classification - ML; estimated AASHTO classification - A-4
6 to 41 inches—stratified silt loam to silty clay loam; subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 46); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6, A-7
41 to 60 inches or more—stratified gravelly sandy loam to gravelly sand; 25 to 50 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-1, A-2
Depth to seasonal high water table: In January to June—6 to 18 inches; rest of year—more than 18 inches
Hazard of flooding: Frequency—frequent; duration—long; months—February through May
Permeability: In the upper 41 inches—moderately slow; below this depth—rapid
Available water capacity: 8.5 to 9.8 inches
Water supplying capacity: 10 to 12 inches
Runoff: Very slow
Hydrologic group: D
Erosion factors (upper layer): K value—0.55; T value—4; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth alluvial flats; contrasting feature—coarser textured throughout the profile; distinctive present vegetation—alkali sacaton, basin wildrye, black greasewood
Inclusion 2: Position on landscape—concave areas of alluvial flats and lake plains; contrasting features—nonsaline, nonsodic; distinctive present vegetation—alkali sacaton, rush
Inclusion 3: Position on landscape—stream terraces, basin floor remnants; contrasting features—coarser textured throughout the profile, well drained; distinctive present vegetation—shadscale, black greasewood

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 56)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—good

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess sodium, excess salt
Roadfill: Poor—wetness
Daily cover for landfill: Poor—wetness, excess sodium
Shallow excavations: Severe—cutbanks cave, wetness
Local roads and streets: Severe—low strength, wetness, flooding
Pond reservoir areas: Moderate—seepage

TABLE 56.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Brinnum	1	2	3
Alkali sacaton	SPAI	30-40	20-30	---	---
Alkali cordgrass	SPGR	5-10	---	---	---
Alkali muhly	MUAS	5-15	---	---	---
Inland saltgrass	DIST	---	5-10	T-2	---
Basin wildrye	ELCI2	---	5-15	T-2	2-5
Bottlebrush squirreltail	SIHY	---	---	7-10	---
Rush	JUNCU	---	---	---	10-15
Sedge	CAREX	---	---	---	5-10
Nevada bluegrass	PONE3	---	---	---	20-30
Other perennial grasses	PPGG	10-15	10-20	---	---
Miterwort	NITRO	---	---	2-3	---
Other perennial forbs	PPFF	5-10	5-10	T-3	5-10
Basin big sagebrush	ARTRT*	---	2-5	---	---
Black greasewood	SAVE4	---	5-10	20-30	---
Fourwing saltbush	ATCA2	---	2-5	---	---
Rubber rabbitbrush	CHNA2	---	2-5	---	---
Shadscale	ATCO	---	---	30-40	---
Bud sagebrush	ARSP5	---	---	5-10	---
Seepweed	SUAED	---	---	5-15	---
Other shrubs	SSSS	5-10	2-5	---	2-5
Range site symbol		028B002N	028B004N	024X003N	028B001N
Potential production (lb/acre):					
Favorable years		3,000	2,000	600	4,000
Normal years		1,500	1,000	450	2,000
Unfavorable years		700	500	300	1,200

Embankments, dikes, and levees: Severe—piping, wetness, excess sodium
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIw, nonirrigated
Range site symbol: 028B002N

401—Brinnum-Humboldt association

Map Unit Setting

Positions on landscape: Basin floor remnants, flood plains
Elevation: 6,000 to 6,150 feet
Climatic data (average annual):
Precipitation—about 8 inches
Air temperature—about 46 degrees F
Frost-free season—about 90 days

Composition

Brinnum silt loam, drained, 0 to 2 percent slopes (Typic Halaquepts - fine-silty, mixed (calcareous), mesic)—55 percent
Humboldt silty clay loam, cool, 0 to 2 percent slopes (Fluvaquentic Haplaquolls - fine, montmorillonitic (calcareous), mesic)—30 percent
Contrasting inclusions as follows:
Inclusion 1: Ocala silt loam, occasionally flooded, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—5 percent
Inclusion 2: Ocala silt loam, rarely flooded, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—5 percent
Inclusion 3: Needle Peak silt loam, occasionally flooded, 0 to 2 percent slopes (Aquic Torriorthents - fine-silty, mixed (calcareous), mesic)—5 percent

Brinnum Soil

Positions on landscape: Basin floor remnants
Parent material: Silty alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Alkali sacaton, alkali muhly, alkali cordgrass, black greasewood
Typical profile:
0 to 20 inches—silt loam; subangular blocky structure; soft, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 20 to 40); estimated Unified classification - ML; estimated AASHTO classification - A-4
20 to 60 inches or more—silt loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification - ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: In February through June—36 to 48 inches; rest of year—more than 60 inches
Hazard of flooding: None
Permeability: Moderately slow
Available water capacity: 11 to 12 inches
Water supplying capacity: 10 to 12 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: High

Humboldt Soil

Positions on landscape: Flood plains
Parent material: Silty alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Rush, sedge, alkali sacaton, inland saltgrass
Typical profile:
0 to 13 inches—silty clay loam; prismatic structure; hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - CL; estimated AASHTO classification - A-6, A-7
13 to 60 inches or more—stratified silty clay loam to clay; massive; hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - MH; estimated AASHTO classification - A-7
Depth to seasonal high water table: In December through July—6 to 24 inches; rest of year—more than 24 inches
Hazard of flooding: Frequency—frequent; duration—brief to long; months—February through June
Permeability: Moderately slow
Available water capacity: 11.0 to 12.5 inches
Water supplying capacity: 14 to 16 inches
Runoff: Ponded to very slow
Hydrologic group: D
Erosion factors (upper layer): K value—0.37; T value—5; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—concave alluvial flats; contrasting features—occasionally flooded, weakly silica-cemented lower layer; distinctive present vegetation—alkali sacaton, basin wildrye, rabbitbrush
Inclusion 2: Position on landscape—smooth alluvial flats; contrasting features—rarely flooded, weakly silica-cemented lower layer; distinctive present vegetation—shadscale, Indian ricegrass

Inclusion 3: Position on landscape—margins of flood plains; contrasting features—occasionally flooded, water table at a depth of 36 to 60 inches; distinctive present vegetation—basin wildrye, basin big sagebrush, black greasewood

Major Uses

Irrigated cropland, rangeland, wildlife habitat

Potential Native Plant Community (Table 57)

Elements of Wildlife Habitat

Suitability of Brinnum soil for named elements:
Grain and seed crops (irrigated)—very poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—fair

Suitability of Humboldt soil for named elements:
Grain and seed crops (irrigated)—very poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—good
Shallow water areas—good

TABLE 57.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Brinnum	Humboldt	1	2	3
Alkali sacaton	SPAI	30-40	---	15-30	5-10	---
Alkali cordgrass	SPGR	5-10	---	---	---	---
Alkali muhly	MUAS	5-15	---	---	---	---
Rush	JUNCU	---	10-15	---	---	---
Sedge	CAREX	---	5-10	---	---	---
Basin wildrye	ELCI2	---	2-5	40-60	2-5	50-60
Nevada bluegrass	PONE3	---	20-30	---	---	---
Inland saltgrass	DIST	---	---	5-10	5-8	2-5
Bottlebrush squirreltail	SIHY	---	---	---	---	2-5
Western wheatgrass	AGSM	---	---	---	---	5-10
Mat muhly	MURI	---	---	---	---	2-5
Other perennial grasses	PPGG	10-15	---	2-4	2-5	2-5
Povertyweed	IVAX	---	---	1-2	---	1-2
Other perennial forbs	PPFF	5-10	5-10	2-4	2-5	2-3
Black greasewood	SAVE4	---	---	5-15	50-60	2-5
Rubber rabbitbrush	CHNA2	---	---	2-5	---	2-5
Shadscale	ATCO	---	---	---	2-5	---
Basin big sagebrush	ARTRT*	---	---	---	---	15-20
Other shrubs	SSSS	5-10	2-5	2-5	5-10	2-4
Range site symbol		028B002N	028B001N	024X007N	028B020N	024X006N
Potential production (lb/acre):						
Favorable years		3,000	4,000	1,900	600	1,500
Normal years		1,500	2,000	1,400	450	1,100
Unfavorable years		700	1,200	800	200	600

Ratings for Selected Uses

Brinnum Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess sodium, excess salt
Roadfill: Fair—low strength, shrink-swell
Daily cover for landfill: Poor—excess sodium
Shallow excavations: Moderate—wetness
Local roads and streets: Severe—frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping, excess sodium
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Humboldt Soil

Suitability and limitations for the following uses:
Rangeland seeding: Good
Roadfill: Poor—frost action, low strength, wetness
Daily cover for landfill: Poor—too clayey, wetness
Shallow excavations: Severe—flooding, wetness
Local roads and streets: Severe—flooding, frost action, wetness
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—hard to pack, wetness
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Brinnum soil—VIw, irrigated, and VIIw, nonirrigated; Humboldt soil—Vw, irrigated and nonirrigated
Range site symbol: Brinnum soil—028B002N; Humboldt soil—028B001N

410—Beanflat silt loam

Map Unit Setting

Positions on landscape: Alluvial flats
Elevation: 6,000 to 6,500 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 80 days

Composition

Beanflat silt loam, 0 to 2 percent slopes (Aeric Halaquepts - coarse-loamy, mixed (calcareous), frigid)—90 percent
Contrasting inclusions as follows:
Inclusion 1: Poorcal loam, 0 to 4 percent slopes (Durixerollic Calciorthids - coarse-loamy, mixed, frigid)—5 percent
Inclusion 2: Durorthidic Xeric Torriorthents, 0 to 4 percent slopes—5 percent

Beanflat Soil

Positions on landscape: Alluvial flats
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, rabbitbrush, alkali sacaton, inland saltgrass, basin wildrye
Typical profile:
0 to 5 inches—silt loam; platy structure; slightly hard, friable; very strongly alkaline (pH 9.2); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification - ML; estimated AASHTO classification - A-4
5 to 22 inches—fine sandy loam, loam, sandy loam; massive; soft, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
22 to 60 inches or more—fine sandy loam, loam, sandy loam; massive; soft, very friable; moderately alkaline (pH 8.2); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: In December through May—30 to 40 inches; rest of year—more than 60 inches
Hazard of flooding: Frequency—occasional; duration—brief; months—December through May
Permeability: Moderate
Available water capacity: 8 to 9 inches
Water supplying capacity: 9 to 10 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.49; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans adjacent to alluvial flats; contrasting features—water table at a depth of more than 60 inches, layer of lime and silica accumulation; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass
Inclusion 2: Position on landscape—remnants of inset fans adjacent to alluvial flats; contrasting features—water table at a depth of more than 60 inches, weak silica cementation; distinctive present vegetation—black greasewood, basin wildrye

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 58)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess sodium, excess salt
Roadfill: Fair—wetness
Daily cover for landfill: Fair—wetness
Shallow excavations: Moderate—wetness, flooding
Local roads and streets: Severe—flooding, frost action
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIw, nonirrigated
Range site symbol: 028B004N

TABLE 58.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Beanflat	1	2
Inland saltgrass	DIST	5-10	---	---
Basin wildrye	ELCI2	5-15	---	5-10
Alkali sacaton	SPAI	20-30	---	---
Indian ricegrass	ORHY	---	20-30	2-5
Needleandthread	STCO4	---	10-20	---
Bottlebrush squirreltail	SIHY	---	5-10	2-5
Sandberg bluegrass	POSE	---	2-5	---
Other perennial grasses	PPGG	10-20	5-10	2-5
Thelypody	THELY	---	---	2-4
Globemallow	SPHAE	---	---	1-2
Other perennial forbs	PPFF	5-10	2-5	1-2
Basin big sagebrush	ARTRT*	2-5	---	10-25
Black greasewood	SAVE4	5-10	---	20-30
Fourwing saltbush	ATCA2	2-5	---	---
Rubber rabbitbrush	CHNA2	2-5	---	---
Wyoming big sagebrush	ARTRW*	---	15-20	---
Spiny hopsage	GRSP	---	---	5-15
Other shrubs	SSSS	2-5	5-10	2-10
Range site symbol		028B004N	028B010N	024X022N
Potential production (lb/acre):				
Favorable years		2,000	800	800
Normal years		1,000	600	600
Unfavorable years		500	400	350

422—Chen-Ramires association, steep

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 6,000 to 7,000 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Chen gravelly loam, 15 to 30 percent slopes (Lithic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—45 percent
Ramires loam, 30 to 50 percent slopes (Aridic Calcic Argixerolls - fine, montmorillonitic, frigid)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—5 percent
Inclusion 2: Torriorthentic Haploxerolls, 2 to 8 percent slopes—5 percent
Inclusion 3: Calcic Argixerolls, 50 to 75 percent slopes—5 percent

Chen Soil

Positions on landscape: South-, east-, and west-facing side slopes of mountains
Parent material: Kind—residuum; source—quartz monzonite, quartz latite, rhyolite influenced by loess high in volcanic ash
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Low sagebrush, Douglas rabbitbrush, Idaho fescue, Nevada bluegrass, Sandberg bluegrass, Thurber needlegrass
Typical profile:
0 to 9 inches—gravelly loam; 0 to 10 percent cobbles and stones and 30 to 40 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, CL-ML, CL; estimated AASHTO classification - A-4, A-6
9 to 17 inches—very gravelly clay, extremely gravelly clay, very cobbly clay; 5 to 45 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; very hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
17 inches—unweathered bedrock
Range in depth to bedrock: 14 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 1.8 to 2.2 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—1; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Ramires Soil

Positions on landscape: North-facing and lower east-facing side slopes of mountains
Parent material: Kind—residuum; source—andesite, rhyolite, tuff with strong influence of loess that is high in content of volcanic ash
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Big sagebrush, Douglas rabbitbrush, balsamroot, lupine, Nevada bluegrass, Sandberg bluegrass, Idaho fescue
Typical profile:
0 to 9 inches—loam; 0 to 10 percent cobbles and stones and 10 to 25 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, CL; estimated AASHTO classification - A-2, A-6
9 to 26 inches—gravelly clay, gravelly clay loam, clay; 0 to 10 percent cobbles and stones and 15 to 35 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
26 to 33 inches—very gravelly clay; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
33 inches—unweathered bedrock
Range in depth to bedrock: 24 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 4.1 to 5.0 inches
Water supplying capacity: 10 to 11 inches

Runoff: Very rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—5
Hazard of erosion: By water—severe; by wind—none
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—eroded crests of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren
Inclusion 2: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, receives additional moisture from runoff; distinctive present vegetation—basin wildrye, basin big sagebrush
Inclusion 3: Position on landscape—upper side slopes of mountains; contrasting features—slopes of more than 50 percent, 40 to 60 inches deep to bedrock; distinctive present vegetation—antelope bitterbrush, Idaho fescue

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 59)

Elements of Wildlife Habitat

Suitability of Chen soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Ramires soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Chen Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—rooting depth, droughty
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Ramires Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—depth to rock, low strength, slope
Daily cover for landfill: Poor—depth to rock, too clayey, hard to pack
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Chen soil—VIIs, nonirrigated; Ramires soil—VIIe, nonirrigated
Range site symbol: Chen soil—025X017N; Ramires soil—025X014N

TABLE 59.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Chen	Ramires	1	2	3
Bluebunch wheatgrass	AGSP	15-30	20-30	---	---	15-30
Idaho fescue	FEID	30-50	---	---	---	15-40
Thurber needlegrass	STTH2	2-10	15-25	---	---	T-10
Bottlebrush squirreltail	SIHY	2-5	---	---	---	---
Nevada bluegrass	PONE3	---	2-10	---	5-10	2-5
Basin wildrye	ELCI2	---	---	---	50-60	5-10
Sedge	CAREX	---	---	---	1-5	---
Mat muhly	MURI	---	---	---	2-5	---
Other perennial grasses	PPGG	2-10	10-15	---	15-20	5-10
Balsamroot	BALSA	2-5	---	---	---	---
Lupine	LUPIN	---	---	---	2-5	---
Hawksbeard	CREPI	---	---	---	---	1-5
Arrowleaf balsamroot	BASA3	---	---	---	---	5-10
Other perennial forbs	PPFF	5-15	2-5	---	5-10	5-15
Low sagebrush	ARAR8	10-25	---	---	---	---
Antelope bitterbrush	PUTR2	T-5	---	---	---	5-15
Big sagebrush	ARTR2	---	10-15	---	---	---
Douglas rabbitbrush	CHVI8	---	5-10	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	10-15	---
Rubber rabbitbrush	CHNA2	---	---	---	2-5	---
Mountain big sagebrush	ARTRV	---	---	---	---	10-15
Other shrubs	SSSS	5-10	---	---	---	5-15

Range site symbol	025XO17N	025XO14N	BARREN	025XO03N	025XO12N
Potential production (lb/acre):					
Favorable years	1,000	1,000	---	2,500	1,200
Normal years	700	800	---	1,900	900
Unfavorable years	400	600	---	1,200	600

423—Chen-Ramires association, moderately steep

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 5,500 to 7,000 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Chen cobbly loam, 15 to 30 percent slopes (Lithic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—45 percent
Ramires loam, 15 to 30 percent slopes (Calcic Argixerolls - fine, montmorillonitic, frigid)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Calcic Argixerolls, 30 to 50 percent slopes (Calcic Argixerolls - fine-loamy, mixed, frigid)—5 percent
Inclusion 2: Mosquet very gravelly sandy loam, 4 to 15 percent slopes (Lithic Ruptic-Argic Cryoborolls - clayey, montmorillonitic)—5 percent
Inclusion 3: Torriorthentic Haploxerolls, 2 to 8 percent slopes (Torriorthentic Haploxerolls - loamy-skeletal, mixed, frigid)—5 percent

Chen Soil

Positions on landscape: South, east, and west aspects of mountain crests and side slopes
Parent material: Kind—residuum; source—rhyolite, quartz latite, and monzonite influenced by loess that is high in content of volcanic ash
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, Douglas rabbitbrush, Idaho fescue, Nevada bluegrass
Typical profile:
0 to 9 inches—cobbly loam; 20 to 25 percent cobbles and stones and 20 to 40 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC; estimated AASHTO classification - A-4
9 to 17 inches—very gravelly clay, extremely gravelly clay, very cobbly clay; 5 to 45 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; very hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
17 inches—unweathered bedrock
Range in depth to bedrock: 14 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 1.7 to 2.1 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.17; T value—1; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Ramires Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum; source—rhyolite, andesite, tuff
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Big sagebrush, Douglas rabbitbrush, lupine, Nevada bluegrass, Sandberg bluegrass, Idaho fescue
Typical profile:
0 to 9 inches—loam; 0 to 10 percent cobbles and stones and 10 to 25 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, CL; estimated AASHTO classification - A-2, A-6
9 to 26 inches—gravelly clay, gravelly clay loam, clay; 0 to 10 percent cobbles and stones and 15 to 35 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
26 to 33 inches—very gravelly clay; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
33 inches—unweathered bedrock
Range in depth to bedrock: 24 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow

Available water capacity: 4.1 to 5.0 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—5
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion: Position on landscape—upper north-facing side slopes of mountains; contrasting feature—slopes of 30 to 50 percent; distinctive present vegetation—antelope bitterbrush, Idaho fescue, bluebunch wheatgrass
Inclusion 2: Position on landscape—shoulders of mountains at high elevations; contrasting features—colder, windswept, shallow, slopes of 4 to 15 percent; distinctive present vegetation—low sagebrush, black sagebrush, Idaho fescue
Inclusion 3: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, slopes of 2 to 8 percent, receives additional moisture from runoff; distinctive present vegetation—basin wildrye, basin big sagebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 60)

Elements of Wildlife Habitat

Suitability of Chen soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Ramires soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Chen Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—rooting depth, droughty
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Ramires Soil

Suitability and limitations for the following uses:
Rangeland seeding: Good
Roadfill: Poor—depth to rock, low strength
Daily cover for landfill: Poor—depth to rock, too clayey, hard to pack
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Chen soil—VIIs, nonirrigated; Ramires soil—VIIe, nonirrigated
Range site symbol: Chen soil—025X017N; Ramires soil—025X014N

TABLE 60.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Chen	Ramires	1	2	3
Bluebunch wheatgrass	AGSP	15-30	20-30	15-30	2-5	---
Idaho fescue	FEID	30-50	---	15-40	10-30	---
Thurber needlegrass	STTH2	2-10	15-25	T-10	---	---
Bottlebrush squirreltail	SIHY	2-5	---	---	---	---
Nevada bluegrass	PONE3	---	2-10	2-5	---	5-10
Basin wildrye	ELCI2	---	---	5-10	---	50-60
Webber ricegrass	ORWE	---	---	---	5-10	---
Cusick bluegrass	POCU3	---	---	---	5-10	---
Sandberg bluegrass	POSE	---	---	---	5-1	---
Sedge	CAREX	---	---	---	---	1-5
Mat muhly	MURI	---	---	---	---	2-5
Other perennial grasses	PPGG	2-10	10-15	5-10	2-8	15-20
Balsamroot	BALSA	2-5	---	---	---	---
Hawksbeard	CREPI	---	---	1-5	2-5	---
Arrowleaf balsamroot	BASA3	---	---	5-10	---	---
Goldenweed	HAPLO	2-5	---	---	2-5	---
Phlox	PHLOX	---	---	---	2-5	---
Lupine	LUPIN	---	---	---	---	2-5
Other perennial forbs	PPFF	5-15	2-5	5-15	5-10	5-10
Low sagebrush	ARAR8	10-25	---	---	5-15	---
Antelope bitterbrush	PUTR2	T-5	---	5-15	---	---
Big sagebrush	ARTR2	---	10-15	---	---	---
Douglas rabbitbrush	CHVI8	---	5-10	---	---	---
Mountain big sagebrush	ARTRV	---	---	10-15	---	---
Black sagebrush	ARARN	---	---	---	5-10	---
Basin big sagebrush	ARTRT*	---	---	---	---	10-15
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5
Other shrubs	SSSS	5-10	---	5-15	2-10	---

Range site symbol	025X017N	025X014N	025X012N	025X024N	025X003N
Potential production (lb/acre):					
Favorable years	1,000	1,000	1,200	350	2,500
Normal years	700	800	900	250	1,900
Unfavorable years	400	600	600	150	1,200

424—Chen-Singletree-Jivas association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 5,600 to 7,500 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 43 degrees F
Frost-free season—about 80 days

Composition

Chen very cobbly loam, 30 to 50 percent slopes (Lithic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—35 percent
Singletree very cobbly loam, 30 to 50 percent slopes (Aridic Calcic Argixerolls - fine-loamy, mixed, frigid)—30 percent
Jivas very cobbly loam, 15 to 50 percent slopes (Aridic Argixerolls - loamy-skeletal, mixed, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Lithic Argixerolls, 15 to 50 percent slopes (Lithic Argixerolls - loamy-skeletal, mixed, frigid)—5 percent
Inclusion 2: Rock outcrop—5 percent
Inclusion 3: Rubble land—5 percent

Chen Soil

Positions on landscape: East, west, and lower south aspects of mountains
Parent material: Kind—residuum; source—rhyolite influenced by loess and volcanic ash
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Low sagebrush, Douglas rabbitbrush, phlox, Nevada bluegrass, Thurber needlegrass
Typical profile:
0 to 9 inches—very cobbly loam; 45 to 55 percent cobbles and stones and 40 to 50 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
9 to 17 inches—very gravelly clay, extremely cobbly clay, very cobbly clay; 5 to 50 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
17 inches—unweathered bedrock
Range in depth to bedrock: 14 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 1.0 to 1.2 inches
Water supplying capacity: 10 to 11 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.15; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Singletree Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum, colluvium; source—andesite influenced by loess and volcanic ash
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Big sagebrush, antelope bitterbrush, balsamroot, Idaho fescue, Thurber needlegrass
Typical profile:
0 to 15 inches—very cobbly loam; 25 to 30 percent cobbles and stones and 35 to 50 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-2, A-4
15 to 35 inches—loam, gravelly loam, clay loam; 0 to 15 percent cobbles and stones and 20 to 40 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, GC, CL; estimated AASHTO classification - A-6
35 to 57 inches—sandy loam, sandy clay loam, gravelly sandy loam; 0 to 15 percent cobbles and stones and 20 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2
57 inches—weathered bedrock
Range in depth to bedrock: 45 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow

Available water capacity: 6.1 to 8.3 inches
Water supplying capacity: 10 to 11 inches
Runoff: Very rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—4; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Jivas Soil

Positions on landscape: Middle and upper side slopes of mountains
Parent material: Kind—residuum, colluvium; source—tuff, andesite, rhyolite
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Big sagebrush, Douglas rabbitbrush, lupine, Sandberg bluegrass, bluebunch wheatgrass
Typical profile:
0 to 12 inches—very cobbly loam; 40 to 55 percent cobbles and stones and 20 to 50 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC, CL, ML; estimated AASHTO classification - A-2, A-4
12 to 45 inches—extremely gravelly sandy clay loam, extremely gravelly clay loam, extremely gravelly loam; 0 to 10 percent cobbles and stones and 70 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GP-GC; estimated AASHTO classification - A-2
45 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 3.2 to 4.1 inches
Water supplying capacity: 12 to 13 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.15; T value—3; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—upper side slopes of mountains near rock outcrops; contrasting feature—shallow to bedrock; distinctive present vegetation—bluebunch wheatgrass, Thurber needlegrass, big sagebrush
Inclusion 2: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren
Inclusion 3: Position on landscape—areas immediately below rock outcrops; contrasting feature—more than 90 percent of surface covered with stones; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 61)

Elements of Wildlife Habitat

Suitability of Chen soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Singletree soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Jivas soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Chen Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—rooting depth, droughty, large stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Singletree Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope

TABLE 61.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Chen	Singletree	Jivas	1	2	3
Bluebunch wheatgrass	AGSP	15-30	15-30	30-50	15-25	---	---
Idaho fescue	FEID	30-50	15-40	2-5	---	---	---
Thurber needlegrass	STTH2	2-10	T-10	2-10	15-25	---	---
Bottlebrush squirreltail	SIHY	2-5	---	---	---	---	---
Basin wildrye	ELCI2	---	5-10	5-10	---	---	---
Nevada bluegrass	PONE3	---	2-5	2-5	---	---	---
Other perennial grasses	PPGG	2-10	5-10	5-10	10-20	---	---
Balsamroot	BALSA	2-5	---	---	---	---	---
Hawksbeard	CREPI	---	1-5	---	---	---	---
Arrowleaf balsamroot	BASA3	---	5-10	2-5	---	---	---
Lupine	LUPIN	---	---	2-5	---	---	---
Other perennial forbs	PPFF	5-15	5-15	2-5	5-15	---	---
Low sagebrush	ARAR8	10-25	---	---	---	---	---
Antelope bitterbrush	PUTR2	T-5	5-15	2-5	2-5	---	---
Mountain big sagebrush	ARTRV	---	10-15	5-10	---	---	---
Big sagebrush	ARTR2	---	---	---	5-10	---	---
Other shrubs	SSSS	5-10	5-15	2-10	2-8	---	---
Range site symbol		025X017N	025X012N	025X009N	025X021N	BARREN	BARREN
Potential production (lb/acre):							
Favorable years		1,000	1,200	1,300	500	---	---
Normal years		700	900	900	400	---	---
Unfavorable years		400	600	700	250	---	---

Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Moderate—thin layer, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Jivas Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site symbol: Chen soil—025X017N; Singletree soil—025X012N; Jivas soil—025X009N

425—Chen-Pie Creek-Ramires association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 5,500 to 7,000 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Chen cobbly loam, 15 to 30 percent slopes (Lithic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—40 percent
Pie Creek very cobbly loam, 15 to 50 percent slopes (Aridic Palexerolls - very-fine, montmorillonitic, frigid)—25 percent
Ramires very stony loam, 15 to 30 percent slopes (Aridic Calcic Argixerolls - fine, montmorillonitic, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—5 percent
Inclusion 2: Fluvaquentic Haplaquolls, 4 to 15 percent slopes (Fluvaquentic Haplaquolls - loamy-skeletal, mixed, frigid)—5 percent
Inclusion 3: Cumulic Haplaquolls, drained, 2 to 8 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—5 percent

Chen Soil

Positions on landscape: Upper side slopes and crests of mountains
Parent material: Kind—residuum; source—rhyolite influenced by loess and volcanic ash
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush, Douglas rabbitbrush, Nevada bluegrass, Thurber needlegrass
Typical profile:
0 to 9 inches—cobbly loam; 20 to 25 percent cobbles and stones and 20 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC; estimated AASHTO classification - A-4
9 to 17 inches—very gravelly clay, extremely gravelly clay, very cobbly clay; 5 to 45 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
17 inches—unweathered bedrock
Range in depth to bedrock: 14 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 1.7 to 2.1 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.17; T value—1; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Pie Creek Soil

Positions on landscape: Lower side slopes of mountains
Parent material: Kind—residuum; source—tuff
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Low sagebrush, Sandberg bluegrass, bottlebrush squirreltail, bluebunch wheatgrass
Typical profile:
0 to 8 inches—very cobbly loam; 40 to 50 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4
8 to 15 inches—clay; 0 to 10 percent pebbles (by weight); prismatic structure; very hard, very firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CH; estimated AASHTO classification - A-7
15 to 23 inches—clay loam, clay; 0 to 10 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL; estimated AASHTO classification - A-7
23 inches—unweathered bedrock
Range in depth to bedrock: 23 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 3.5 to 4.1 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: D

Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Ramires Soil

Positions on landscape: Middle and upper side slopes of mountains
Parent material: Kind—residuum; source—tuff, rhyolite, andesite
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Big sagebrush, Douglas rabbitbrush, lupine, Sandberg bluegrass, bluebunch wheatgrass
Typical profile:
0 to 9 inches—very stony loam; 20 to 40 percent cobbles and stones and 20 to 30 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL; estimated AASHTO classification - A-6
9 to 26 inches—clay, gravelly clay, gravelly clay loam; 0 to 10 percent cobbles and stones and 15 to 35 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
26 to 33 inches—sandy loam, sandy clay loam; 0 to 10 percent cobbles and stones and 15 to 25 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC; estimated AASHTO classification - A-2
33 inches—unweathered bedrock
Range in depth to bedrock: 24 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 4.3 to 5.4 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.17; T value—3; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren
Inclusion 2: Position on landscape—spring and seep areas; contrasting features—very deep, wet; distinctive present vegetation—tufted hairgrass, sedge
Inclusion 3: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, moderately wet; distinctive present vegetation—bluebunch wheatgrass, basin big sagebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 62)

Elements of Wildlife Habitat

Suitability of Chen soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Pie Creek soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Ramires soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Chen Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—rooting depth, droughty
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Pie Creek Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—rooting depth. large stones
Roadfill: Poor—depth to rock, low strength
Daily cover for landfill: Poor—depth to rock, too clayey, slope
Shallow excavations: Severe—depth to rock, slope

TABLE 62.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Chen	Pie Creek	Ramires	1	2	3
Bluebunch wheatgrass	AGSP	15-30	15-40	20-30	---	---	---
Idaho fescue	FEID	30-50	2-5	---	---	---	---
Thurber needlegrass	STTH2	2-10	15-40	15-25	---	---	---
Bottlebrush squirreltail	SIHY	2-5	2-5	---	---	---	---
Webber ricegrass	ORWE	---	5-15	---	---	---	---
Pine bluegrass	POSC	---	2-10	---	---	---	---
Sandberg bluegrass	POSE	---	2-10	---	---	---	---
Basin wildrye	ELCI2	---	1-5	---	---	---	50-60
Nevada bluegrass	PONE3	---	---	2-10	---	5-10	5-10
Tufted hairgrass	DECA5	---	---	---	---	30-60	---
Sedge	CAREX	---	---	---	---	5-10	1-5
Alpine timothy	PHAL2	---	---	---	---	5-10	---
Mat muhly	MURI	---	---	---	---	---	2-5
Other perennial grasses	PPGG	2-10	---	10-15	---	2-10	15-20
Balsamroot	BALSA	2-5	---	---	---	---	---
Sierra clover	TRWO	---	---	---	---	2-5	---
Cinquefoil	POTEN	---	---	---	---	2-5	---
Lupine	LUPIN	---	---	---	---	---	2-5
Other perennial forbs	PPFF	5-15	5-10	2-5	---	10-20	5-10
Low sagebrush	ARAR8	10-25	15-25	---	---	---	---
Antelope bitterbrush	PUTR2	T-5	T-5	---	---	---	---
Douglas rabbitbrush	CHVI8	---	2-5	5-10	---	---	---
Big sagebrush	ARTR2	---	---	10-15	---	---	---
Willow	SALIX	---	---	---	---	2-5	---
Basin big sagebrush	ARTRT*	---	---	---	---	---	10-15
Rubber rabbitbrush	CHNA2	---	---	---	---	---	2-5
Other shrubs	SSSS	5-10	---	---	---	---	---

Range site symbol	025X017N	025X018N	025X014N	BARREN	025X005N	025X003N
Potential production (lb/acre):						
Favorable years	1,000	800	1,000	---	2,000	2,500
Normal years	700	600	800	---	1,700	1,900
Unfavorable years	400	400	600	---	1,000	1,200

Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Ramires Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—depth to rock, low strength

Daily cover for landfill: Poor—depth to rock, too clayey, hard to pack
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Chen soil—VIIs, nonirrigated; Pie Creek soil—VIIs, nonirrigated; Ramires soil—VIs, nonirrigated
Range site symbol: Chen soil—025X017N; Pie Creek soil—025X018N; Ramires soil—025X014N

431—Ramires-Singletree association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 5,500 to 6,500 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 43 degrees F
Frost-free season—about 90 days

Composition

Ramires gravelly clay loam, 30 to 50 percent slopes (Aridic Calcic Argixerolls - fine, montmorillonitic, frigid)—45 percent
Singletree gravelly loam, 50 to 75 percent slopes (Aridic Calcic Argixerolls - fine-loamy, mixed, frigid)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Ramires gravelly clay loam, 15 to 30 percent slopes (Aridic Calcic Argixerolls - fine, montmorillonitic, frigid)—5 percent
Inclusion 2: Singletree gravelly loam, 30 to 50 percent slopes (Aridic Calcic Argixerolls - fine-loamy, mixed, frigid)—5 percent
Inclusion 3: Torriorthentic Haploxerolls, 4 to 15 percent slopes (Torriorthentic Haploxerolls - loamy-skeletal, mixed, frigid)—5 percent

Ramires Soil

Positions on landscape: South-, west-, and east-facing side slopes of mountains
Parent material: Kind—residuum; source—tuff
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Big sagebrush, Douglas rabbitbrush, lupine, Sandberg bluegrass, bluebunch wheatgrass
Typical profile:
0 to 9 inches—gravelly clay loam; 0 to 15 percent cobbles and stones and 40 to 50 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-6, A-7
9 to 26 inches—gravelly clay, gravelly clay loam, clay; 0 to 10 percent cobbles and stones and 15 to 35 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
26 to 33 inches—sandy loam, sandy clay loam; 0 to 10 percent cobbles and stones and 15 to 25 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC; estimated AASHTO classification - A-2
33 inches—unweathered bedrock
Range in depth to bedrock: 24 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 4.2 to 5.2 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—3; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Moderate

Singletree Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum, colluvium; source—tuff influenced by loess and volcanic ash
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Big sagebrush, serviceberry, Douglas rabbitbrush, Idaho fescue, bottlebrush squirreltail
Typical profile:
0 to 15 inches—gravelly loam; 25 to 40 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-4
15 to 35 inches—clay loam, gravelly clay loam, loam; 0 to 15 percent cobbles and stones and 20 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, GC, CL; estimated AASHTO classification - A-6
35 to 57 inches—sandy loam, sandy clay loam, gravelly sandy loam; 0 to 15 percent cobbles and stones and 20 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than

2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2
57 inches—weathered bedrock
Range in depth to bedrock: 45 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 7.2 to 9.6 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid to very rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.32; T value—4; wind erodibility group—5
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—southeast- and east-facing lower side slopes of mountains; contrasting feature—slopes of 15 to 30 percent; distinctive present vegetation—big sagebrush, Douglas rabbitbrush, lupine, Sandberg bluegrass, bluebunch wheatgrass
Inclusion 2: Position on landscape—north-facing lower side slopes of mountains; contrasting features—deep, slopes of 30 to 50 percent; distinctive present vegetation—big sagebrush, serviceberry, Douglas rabbitbrush, Idaho fescue, bottlebrush squirreltail
Inclusion 3: Position on landscape—narrow drainageways of mountains; contrasting feature—slopes of less than 15 percent, receives additional moisture from runoff; distinctive present vegetation—basin big sagebrush, basin wildrye

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 63)

Elements of Wildlife Habitat

Suitability of Ramires soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Singletree soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Ramires Soil

Suitability and limitations for the following uses:
Rangeland seeding: Severe—erodes easily
Roadfill: Poor—depth to rock, low strength, slope
Daily cover for landfill: Poor—depth to rock, too clayey, hard to pack
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Moderate—thin layer, hard to pack
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Singletree Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIe, nonirrigated
Range site symbol: Ramires soil—025X014N; Singletree soil—025X012N

TABLE 63.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Ramires	Singletree	1	2	3
Bluebunch wheatgrass	AGSP	20-30	15-30	20-30	15-30	---
Thurber needlegrass	STTH2	15-25	T-10	15-25	T-10	---
Nevada bluegrass	PONE3	2-10	2-5	2-10	2-5	5-10
Idaho fescue	FEID	---	15-40	---	15-40	---
Basin wildrye	ELCI2	---	5-10	---	5-10	50-60
Sedge	CAREX	---	---	---	---	1-5
Mat muhly	MURI	---	---	---	---	2-5
Other perennial grasses	PPGG	10-15	5-10	10-15	5-10	15-20
Hawksbeard	CREPI	---	1-5	---	1-5	---
Arrowleaf balsamroot	BASA3	---	5-10	---	5-10	---
Lupine	LUPIN	---	---	---	---	2-5
Other perennial forbs	PPFF	2-5	5-15	2-5	5-15	5-10
Big sagebrush	ARTR2	10-15	---	10-15	---	---
Douglas rabbitbrush	CHVI8	5-10	---	5-10	---	---
Antelope bitterbrush	PUTR2	---	5-15	---	5-15	---
Mountain big sagebrush	ARTRV	---	10-15	---	10-15	---
Basin big sagebrush	ARTRT*	---	---	---	---	10-15
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5
Other shrubs	SSSS	---	5-15	---	5-15	---
Range site symbol		025X014N	025X012N	025X012N	025X014N	025X003N
Potential production (lb/acre):						
Favorable years		1,000	1,200	1,000	1,200	2,500
Normal years		800	900	800	900	1,900
Unfavorable years		600	600	600	600	1,200

440—Akercan loam

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 6,200 to 7,000 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 85 days

Composition

Akercan loam, 0 to 2 percent slopes (Xerollic Camborthids - fine-loamy, mixed, frigid)—90 percent
Contrasting inclusions as follows:
Inclusion 1: Jesse Camp silt loam (Xerollic Camborthids - fine-silty, mixed, frigid)—5 percent
Inclusion 2: Pedoli loam, 4 to 15 percent slopes (Xerollic Haplargids - fine-loamy, mixed, frigid)—4 percent
Inclusion 3: Haploxerollic Durargids, shallow, 0 to 4 percent slopes—1 percent

Akercan Soil

Positions on landscape: Inset fans
Parent material: Mixed alluvium
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, bud sagebrush, Indian ricegrass, small rabbitbrush
Typical profile:
0 to 5 inches—loam; platy structure; slightly hard, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 49 inches—loam, silt loam, fine sandy loam; subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL; estimated AASHTO classification - A-6
49 to 60 inches or more—very fine sandy loam, loam, silt loam; massive; soft, very friable; mildly alkaline (pH 7.8); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 9.5 to 11.0 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.37; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—side slopes of fan piedmont remnants adjacent to inset fans; contrasting feature—layer of clay accumulation; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass, bottlebrush squirreltail
Inclusion 2: Position on landscape—areas adjacent to channels of inset fans; contrasting feature—silty throughout the upper 40 inches; distinctive present vegetation—basin big sagebrush, rabbitbrush
Inclusion 3: Position on landscape—summits of fan piedmont remnants adjacent to inset fans; contrasting features—layer of clay accumulation, strongly cemented hardpan at a depth of less than 20 inches; distinctive present vegetation—black sagebrush, shadscale

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 64)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—low strength, frost action, shrink-swell
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Moderate—thin layer, piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 64.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Akercan	1	2	3
Indian ricegrass	ORHY	20-30	20-30	---	15-25
Needleandthread	STCO4	10-20	10-20	---	5-10
Bottlebrush squirreltail	SIHY	5-10	5-10	---	---
Sandberg bluegrass	POSE	2-5	2-5	---	---
Basin wildrye	ELCI2	---	---	30-50	2-5
Wheatgrass	AGROP2	---	---	2-5	---
Nevada bluegrass	PONE3	---	---	2-5	---
Bluebunch wheatgrass	AGSP	---	---	---	2-5
Other perennial grasses	PPGG	5-10	5-10	15-25	10-20
Perennial forbs	PPFF	2-5	2-5	2-5	5-10
Wyoming big sagebrush	ARTRW*	15-20	15-20	1-2	---
Basin big sagebrush	ARTRT*	---	---	5-10	---
Black sagebrush	ARARN	---	---	---	20-30
Bud sagebrush	ARSP5	---	---	---	2-5
Winterfat	EULA5	---	---	---	5-10
Small rabbitbrush	CHVIS	---	---	---	2-5
Other shrubs	SSSS	5-10	5-10	5-8	10-20
Range site symbol		028B010N	028B010N	028B003N	028B011N
Potential production (lb/acre):					
Favorable years		800	800	2,600	900
Normal years		600	600	1,250	700
Unfavorable years		400	400	800	400

Interpretive Groups

Range site symbol: 028B010N

Capability classification: IIIc, irrigated, and VIc, nonirrigated

451—Foxmount-Haunchee-Rock outcrop association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 7,500 to 9,000 feet
Climatic data (average annual):
Precipitation—about 17 inches
Air temperature—about 42 degrees F
Frost-free season—about 40 days

Composition

Foxmount loam, 15 to 50 percent slopes (Typic Cryoborolls - loamy-skeletal, mixed)—40 percent
Haunchee very gravelly loam, 30 to 75 percent slopes (Cryic Lithic Rendolls - loamy-skeletal, carbonatic)—30 percent
Rock outcrop—15 percent
Contrasting inclusions as follows:
Inclusion 1: Hatur very gravelly loam, 15 to 50 percent slopes (Cryic Rendolls - loamy-skeletal, carbonatic)—10 percent
Inclusion 2: Argic Pachic Cryoborolls, 8 to 30 percent slopes—3 percent
Inclusion 3: Cumulic Cryaquolls, 2 to 8 percent slopes—2 percent

Foxmount Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum, colluvium; source—andesite, rhyolite
Slope features: Length—long; shape—smooth to concave
Dominant present vegetation: Curlleaf mountainmahogany, mountain big sagebrush, Idaho fescue, creeping barberry
Typical profile:
0 to 3 inches—loam; 0 to 10 percent cobbles and stones and 0 to 25 percent pebbles (by weight); subangular blocky structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - ML; estimated AASHTO classification - A-4
3 to 15 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2, A-4
15 to 37 inches—very cobbly loam, very cobbly sandy loam, extremely cobbly loam; 40 to 55 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2
37 inches—weathered bedrock
Range in depth to bedrock: 24 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 2.5 to 4.5 inches
Water supplying capacity: 14 to 16 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.28; T value—2; wind erodibility group—5
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Haunchee Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—limestone, dolostone
Slope features: Length—short; shape—convex
Dominant present vegetation: Curlleaf mountainmahogany, mountain big sagebrush, snowberry, serviceberry, Idaho fescue
Typical profile:
0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 75 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
4 to 12 inches—very gravelly loam, very gravelly very fine sandy loam; 0 to 30 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
12 inches—unweathered bedrock
Range in depth to bedrock: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 1.0 to 2.2 inches

Water supplying capacity: 13 to 14 inches
Runoff: Rapid to very rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.15; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Rock Outcrop

Positions on landscape: Crests of mountains
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1: Position on landscape—concave, lower side slopes of mountains; contrasting features—hard bedrock at a depth of 20 to 40 inches, calcareous throughout the profile; distinctive present vegetation—Idaho fescue, mountain big sagebrush
Inclusion 2: Position on landscape—concave north-facing side slopes of mountains; contrasting features—dark-colored upper layer more than 16 inches thick, layer of clay accumulation over bedrock at a depth of more than 40 inches; distinctive present vegetation—common chokecherry, snowberry, Idaho fescue
Inclusion 3: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, wet; distinctive present vegetation—tufted hairgrass, sedge, willow

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 65)

Elements of Wildlife Habitat

Suitability of Foxmount soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Suitability of Haunchee soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Foxmount Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Haunchee Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones, droughty, erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Foxmount soil—VIIe, nonirrigated; Haunchee soil—VIIs, nonirrigated; Rock outcrop—VIIIs, nonirrigated
Range site symbol: Foxmount soil—028B042N; Haunchee soil—028B043N

TABLE 65.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Foxmount	Haunchee	Rock outcrop	1	2	3
Bluebunch wheatgrass	AGSP	10-20	5-10	---	2-5	---	1-3
Idaho fescue	FEID	1-2	5-15	---	10-15	---	5-10
Basin wildrye	ELCI2	1-5	---	---	1-2	---	1-5
Pine bluegrass	POSC	5-10	2-5	---	---	---	---
Thurber needlegrass	STTH2	10-15	2-5	---	---	---	---
Indian ricegrass	ORHY	2-5	---	---	---	---	---
Columbia needlegrass	STCO3	---	5-10	---	2-5	---	---
Western needlegrass	STOC2	---	5-10	---	---	---	---
Letterman needlegrass	STLE4	---	2-5	---	5-10	---	---
Mountain brome	BRMA4	---	---	---	15-20	---	2-5
Slender wheatgrass	AGTR	---	---	---	1-2	---	---
Spike-fescue	HEKI	---	---	---	5-10	---	---
Nevada bluegrass	PONE3	---	---	---	---	5-10	---
Tufted hairgrass	DECA5	---	---	---	---	30-60	---
Sedge	CAREX	---	---	---	---	5-10	---
Alpine timothy	PHAL2	---	---	---	---	5-10	---
Other perennial grasses	PPGG	2-4	5-10	---	5-10	2-10	5-15
Sierra clover	TRWO	---	---	---	---	2-5	---
Cinquefoil	POTEN	---	---	---	---	2-5	---
Other perennial forbs	PPFF	10-20	10-15	---	5-10	10-20	5-15
Curlleaf mountainmahogany	CELE3	5-10	---	---	---	---	---
Mountain big sagebrush	ARTRV	5-10	5-10	---	10-20	---	1-5
Snowberry	SYMPH	1- 5	1-5	---	5-10	---	5-10
Mountainmahogany	CERCO	---	5-10	---	---	---	---
Serviceberry	AMELA	---	---	---	5-10	---	2-5
Willow	SALIX	---	---	---	---	2-5	---
Common chokecherry	PRVI	---	---	---	---	---	20-30
Other shrubs	SSSS	5-10	5-10	---	5-10	---	10-15

Range site symbol	028B042N	028B043N	BARREN	028B029N	025X005N	028B026N
Potential production (lb/acre):						
Favorable years	900	1,000	---	1,500	2,000	1,400
Normal years	600	800	---	900	1,700	1,000
Unfavorable years	400	600	---	700	1,000	700

452—Foxmount-Winu-Hackwood association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 7,800 to 8,500 feet
Climatic data (average annual):
Precipitation—about 18 inches
Air temperature—about 42 degrees F
Frost-free season—about 50 days

Composition

Foxmount loam, 15 to 50 percent slopes (Typic Cryoborolls - loamy-skeletal, mixed)—50 percent
Winu very stony loam, 15 to 30 percent slopes (Argic Pachic Cryoborolls - fine-loamy, mixed)—20 percent
Hackwood bouldery silt loam, 15 to 30 percent slopes (Pachic Cryoborolls - fine-loamy, mixed)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Lithic Cryoborolls, 15 to 30 percent slopes—7 percent
Inclusion 2: Labshaft very stony loam, 15 to 50 percent slopes—5 percent
Inclusion 3: Rock outcrop—3 percent

Foxmount Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum, colluvium; source—andesite, rhyolite
Slope features: Length—long; shape—smooth to slightly convex
Dominant present vegetation: Curlleaf mountainmahogany, mountain big sagebrush, snowberry
Typical profile:
0 to 3 inches—loam; 0 to 10 percent cobbles and stones and 0 to 25 percent pebbles (by weight); subangular blocky structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - ML; estimated AASHTO classification - A-4
3 to 15 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2, A-4
15 to 37 inches—very cobbly loam, very cobbly sandy loam, extremely cobbly loam; 40 to 55 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2
37 inches—weathered bedrock
Range in depth to bedrock: 24 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 2.5 to 4.5 inches
Water supplying capacity: 14 to 16 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.28; T value—2; wind erodibility group—5
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Winu Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—colluvium, residuum; source—volcanic rock
Slope features: Length—short; shape—convex
Dominant present vegetation: Mountain big sagebrush, snowberry, bluebunch wheatgrass, Sandberg bluegrass
Typical profile:
0 to 8 inches—very stony loam; 50 to 70 percent cobbles and stones and 20 to 30 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
8 to 32 inches—gravelly loam, gravelly sandy clay loam, gravelly clay loam; 5 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC, SC; estimated AASHTO classification - A-6
32 inches—unweathered bedrock
Range in depth to bedrock: 24 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately slow
Available water capacity: 2.5 to 5.0 inches
Water supplying capacity: 15 to 16 inches
Runoff: Rapid
Hydrologic group: C

Erosion factors (upper layer): K value—0.28; T value—3; wind erodibility group—5
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—moderate
Potential frost action: Moderate

Hackwood Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—alluvium, colluvium; source—volcanic rock influenced by loess
Slope features: Length—short; shape—concave
Dominant present vegetation: Quaking aspen, snowberry, serviceberry, elderberry, Idaho fescue
Typical profile:
0 to 24 inches—bouldery silt loam; 10 to 15 percent cobbles and stones and 10 to 20 percent pebbles (by weight); subangular blocky structure; soft, friable; slightly acid (pH 6.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL; estimated AASHTO classification - A-6
24 to 37 inches—gravelly loam, gravelly silt loam; 25 to 50 percent pebbles (by weight); massive; hard, firm; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC, SM-SC, CL-ML, CL; estimated AASHTO classification - A-4, A-6
37 to 60 inches or more—very gravelly clay loam, very gravelly silty clay loam, very gravelly loam; 50 to 65 percent pebbles (by weight); massive; hard, firm; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-6
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 6.5 to 9.5 inches
Water supplying capacity: 16 to 20 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—17; T value—5; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—bedrock at a depth of less than 20 inches; distinctive present vegetation—low sagebrush, black sagebrush, Idaho fescue
Inclusion 2: Position on landscape—convex upper side slopes of mountains; contrasting feature—bedrock at a depth of less than 20 inches; distinctive present vegetation—curlleaf mountainmahogany, big sagebrush
Inclusion 3: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 66)

Woodland

Hackwood Soil

Site index for common trees: Quaking aspen—40
Most important native understory plants: Idaho fescue, mountain brome, mountain big sagebrush

Elements of Wildlife Habitat

Suitability of Foxmount soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Winu soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Hackwood soil for named elements:
Wild herbaceous plants (nonirrigated)—good
Hardwood trees (nonirrigated)—good
Shrubs (nonirrigated)—good

Ratings for Selected Uses

Foxmount Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Winu Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—depth to rock

TABLE 66.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Foxmount	Winu	Hackwood	1	2	3
Bluebunch wheatgrass	AGSP	10-20	2-5	---	5-10	5-10	---
Idaho fescue	FEID	1-2	10-15	X	10-15	5-15	---
Basin wildrye	ELCI2	1-5	1-2	---	---	---	---
Pine bluegrass	POSC	5-10	---	---	5-10	2-5	---
Thurber needlegrass	STTH2	10-15	---	---	2-5	2-5	---
Indian ricegrass	ORHY	2-5	---	---	2-5	---	---
Letterman needlegrass	STLE4	---	5-10	---	2-5	2-5	---
Mountain brome	BRMA4	---	15-20	X	---	---	---
Columbia needlegrass	STCO3	---	2-5	---	---	5-10	---
Slender wheatgrass	AGTR	---	1-2	---	---	---	---
Spike-fescue	HEKI	---	5-10	---	---	---	---
Bottlebrush squirreltail	SIHY	---	---	---	2-5	---	---
Western needlegrass	STOC2	---	---	---	---	5-10	---
Other perennial grasses	PPGG	2-4	5-10	---	10-15	5-10	---
Perennial forbs	PPFF	10-20	5-10	---	5-10	10-15	---
Curlleaf mountainmahogany	CELE3	5-10	---	---	---	---	---
Mountain big sagebrush	ARTRV	5-10	10-20	X	---	5-10	---
Snowberry	SYMPH	1-5	5-10	---	2-5	1-5	---
Serviceberry	AMELA	---	5-10	---	---	---	---
Quaking aspen	POTR5	---	---	X	---	---	---
Low sagebrush	ARAR8	---	---	---	20-35	---	---
Low rabbitbrush	CHVIH2	---	---	---	2-5	---	---
Horsebrush	TETRA3	---	---	---	2-5	---	---
Mountainmahogany	CERCO	---	---	---	---	5-10	---
Other shrubs	SSSS	5-10	5-10	---	5-10	5-10	---
Range site symbol		028B042N	028B029N	---	028B038N	028B043N	BARREN
Woodland site symbol		---	---	025X065N	---	---	---
Potential production (lb/acre):							
Favorable years		900	1,500	800	800	1,000	---
Normal years		600	900	600	600	800	---
Unfavorable years		400	700	400	400	600	---

Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Moderate—depth to rock

Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Hackwood Soil

Suitability and limitations for the following uses:

Rangeland seeding: Fair—large stones
Roadfill: Fair—slope, shrink-swell
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Slight
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Foxmount soil—VIIe, nonirrigated; Winu soil—VIs, nonirrigated; Hackwood soil—VIIs, nonirrigated
Range site symbol: Foxmount soil—028B042N; Winu soil—028B029N
Woodland suitability group: Hackwood soil—5o

462—Haunchee-Hatur-Rock outcrop association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 8,000 to 9,500 feet
Climatic data (average annual):
Precipitation—about 16 inches
Air temperature—about 42 degrees F
Frost-free season—about 50 days

Composition

Haunchee very gravelly loam, 30 to 75 percent slopes (Cryic Lithic Rendolls - loamy-skeletal, carbonatic)—45 percent
Hatur very gravelly loam, 15 to 50 percent slopes (Cryic Rendolls - loamy-skeletal, carbonatic)—30 percent
Rock outcrop—15 percent
Contrasting inclusions as follows:
Inclusion 1: Foxmount loam, 8 to 30 percent slopes (Typic Cryoborolls - loamy-skeletal, mixed)—5 percent
Inclusion 2: Argic Pachic Cryoborolls, 8 to 30 percent slopes—3 percent
Inclusion 3: Cumulic Cryaquolls, 2 to 8 percent slopes—2 percent

Haunchee Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—limestone, dolostone
Slope features: Length—short; shape—convex
Dominant present vegetation: Curlleaf mountainmahogany, mountain big sagebrush, snowberry, serviceberry, Idaho fescue
Typical profile:
0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 75 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
4 to 12 inches—very gravelly loam, very gravelly very fine sandy loam; 0 to 30 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
12 inches—unweathered bedrock
Range in depth to bedrock: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 1.0 to 2.2 inches
Water supplying capacity: 13 to 14 inches
Runoff: Rapid to very rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.15; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Hatur Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—colluvium, residuum; source—limestone, dolostone
Slope features: Length—short; shape—concave
Dominant present vegetation: Mountain big sagebrush, Idaho fescue, mountain brome, snowberry, Sandberg bluegrass
Typical profile:
0 to 10 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); granular structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
10 to 35 inches—extremely gravelly loam, extremely gravelly sandy loam; 0 to 25 percent cobbles and stones and 75 to 85 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, GP-GM; estimated AASHTO classification - A-1
35 inches—unweathered bedrock
Range in depth to bedrock: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 2.5 to 4.5 inches
Water supplying capacity: 13 to 14 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.10; T value—2; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Rock Outcrop

Positions on landscape: Convex crests and upper side slopes of mountains
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1: Position on landscape—lower side slopes of mountains; contrasting feature—noncalcareous; distinctive present vegetation—mountainmahogany, snowberry
Inclusion 2: Position on landscape—concave areas where snow accumulates; contrasting features—dark-colored upper layer more than 16 inches thick, layer of clay accumulation, receives additional moisture from drifted snow; distinctive present vegetation—common chokeberry, snowberry
Inclusion 3: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, wet; distinctive present vegetation—sedge, tufted hairgrass, willow

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 67)

Elements of Wildlife Habitat

Suitability of Haunchee soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Hatur soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Haunchee Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones, droughty, erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Hatur Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, seepage, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—small stones
Gravel: Improbable source—thin layer

Interpretive Groups

Capability classification: Haunchee soil—VIIs, nonirrigated; Hatur soil—VIIs, nonirrigated; Rock outcrop—VIII, nonirrigated
Range site symbol: Haunchee soil—028B043N; Hatur soil—028B029N

TABLE 67.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Haunchee	Hatur	Rock outcrop	1	2	3
Pine bluegrass	POSC	2-5	---	---	5-10	---	---
Thurber needlegrass	STTH2	2-5	---	---	10-15	---	---
Idaho fescue	FEID	5-15	10-15	---	1-2	5-10	---
Bluebunch wheatgrass	AGSP	5-10	2-5	---	10-20	1-3	---
Columbia needlegrass	STCO3	5-10	2-5	---	---	---	---
Western needlegrass	STOC2	5-10	---	---	---	---	---
Letterman needlegrass	STLE4	2-5	5-10	---	---	---	---
Mountain brome	BRMA4	---	15-20	---	---	2-5	---
Slender wheatgrass	AGTR	---	1-2	---	---	---	---
Basin wildrye	ELCI2	---	1-2	---	1-5	1-5	---
Spike-fescue	HEKI	---	5-10	---	---	---	---
Indian ricegrass	ORHY	---	---	---	2-5	---	---
Nevada bluegrass	PONE3	---	---	---	---	---	5-10
Tufted hairgrass	DECA5	---	---	---	---	---	30-60
Sedge	CAREX	---	---	---	---	---	5-10
Alpine timothy	PHAL2	---	---	---	---	---	5-10
Other perennial grasses	PPGG	5-10	5-10	---	2-4	5-15	2-10
Sierra clover	TRWO	---	---	---	---	---	2-5
Cinquefoil	POTEN	---	---	---	---	---	2-5
Other perennial forbs	PPFF	10-15	5-10	---	10-20	5-15	10-20
Mountainmahogany	CERCO	5-10	---	---	---	---	---
Mountain big sagebrush	ARTRV	5-10	10-20	---	5-10	1-5	---
Snowberry	SYMPH	1-5	5-10	---	1-5	5-10	---
Serviceberry	AMELA	---	5-10	---	---	2-5	---
Curlleaf mountainmahogany	CELE3	---	---	---	5-10	---	---
Common chokecherry	PRVI	---	---	---	---	20-30	---
Willow	SALIX	---	---	---	---	---	2-5
Other shrubs	SSSS	5-10	5-10	---	5-10	10-15	---

Range site symbol	028B043N	028B029N	BARREN	028B042N	028B026N	025X005N
Potential production (lb/acre):						
Favorable years	1,000	1,500	---	900	1,400	2,000
Normal years	800	900	---	600	1,000	1,700
Unfavorable years	600	700	---	400	700	1,000

471—Labshaft-Winu association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 7,800 to 9,200 feet
Climatic data (average annual):
Precipitation—about 16 inches
Air temperature—about 42 degrees F
Frost-free season—about 50 days

Composition

Labshaft very stony loam, 15 to 50 percent slopes (Lithic Cryoborolls - loamy-skeletal, mixed)—50 percent
Winu gravelly loam, 15 to 30 percent slopes (Argic Pachic Cryoborolls - fine-loamy, mixed)—35 percent
Contrasting inclusions as follows:
Inclusion 1: Argic Pachic Cryoborolls, 8 to 30 percent slopes—8 percent
Inclusion 2: Spinlin extremely stony loam, 8 to 30 percent slopes (Argic Cryoborolls - clayey-skeletal, montmorillonitic)—5 percent
Inclusion 3: Rock outcrop—2 percent

Labshaft Soil

Positions on landscape: Middle and upper side slopes of mountains
Parent material: Kind—residuum; source—quartzite
Slope features: Length—long; shape—smooth to convex
Dominant present vegetation: Curlleaf mountainmahogany, basin wildrye, mountain big sagebrush, snowberry, creeping barberry
Typical profile:
0 to 5 inches—very stony loam; 15 to 25 percent cobbles and stones and 25 to 40 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, CL, GC; estimated AASHTO classification - A-2, A-6
5 to 11 inches—very gravelly loam, very gravelly clay loam, extremely gravelly sandy clay loam; 15 to 25 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
11 inches—unweathered bedrock
Range in depth to bedrock: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 1.1 to 1.3 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.17; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Winu Soil

Positions on landscape: Middle and lower side slopes of mountains
Parent material: Kind—residuum, colluvium; source—mixed volcanic rocks
Slope features: Length—short; shape—smooth to concave
Dominant present vegetation: Mountain big sagebrush, mountain brome, basin wildrye, Idaho fescue
Typical profile:
0 to 8 inches—gravelly loam; 25 to 50 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, CL-ML; estimated AASHTO classification - A-2, A-4
8 to 32 inches—gravelly loam, gravelly sandy clay loam, gravelly clay loam; 5 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, SC; estimated AASHTO classification - A-6
32 inches—unweathered bedrock
Range in depth to bedrock: 24 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 3.4 to 4.3 inches
Water supplying capacity: 15 to 16 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.20; T value—3; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—moderate
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—concave north-facing side slopes of mountains; contrasting feature—receives additional moisture from drifted snow; distinctive present vegetation—common chokecherry, snowberry, mountain big sagebrush, Idaho fescue
Inclusion 2: Position on landscape—convex crests and south-facing upper side slopes of mountains; contrasting feature—clayey middle layer; distinctive present vegetation—low sagebrush, bottlebrush squirreltail, pine bluegrass, small rabbitbrush
Inclusion 3: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 68)

Elements of Wildlife Habitat

Suitability of Labshaft soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Winu soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Labshaft Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, large stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Winu Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Labshaft soil—VIIs, nonirrigated; Winu soil—VIe, nonirrigated
Range site symbol: Labshaft soil—028B043N; Winu soil—028B029N

TABLE 68.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Labshaft	Winu	1	2	3
Pine bluegrass	POSC	2-5	---	---	5-10	---
Thurber needlegrass	STTH2	2-5	---	---	2-5	---
Idaho fescue	FEID	5-15	10-15	5-10	2-5	---
Bluebunch wheatgrass	AGSP	5-10	2-5	1-3	5-10	---
Columbia needlegrass	STCO3	5-10	2-5	---	---	---
Western needlegrass	STOC2	5-10	---	---	---	---
Letterman needlegrass	STLE4	2-5	5-10	---	---	---
Mountain brome	BRMA4	---	15-20	2-5	---	---
Slender wheatgrass	AGTR	---	1-2	---	---	---
Basin wildrye	ELCI2	---	1-2	1-5	---	---
Spike-fescue	HEKI	---	5-10	---	---	---
Indian ricegrass	ORHY	---	---	---	2-5	---
Bottlebrush squirreltail	SIHY	---	---	---	2-5	---
Other perennial grasses	PPGG	5-10	5-10	5-15	10-15	---
Perennial forbs	PPFF	10-15	5-10	5-15	10-15	---
Mountainmahogany	CERCO	5-10	---	---	---	---
Mountain big sagebrush	ARTRV	5-10	10-20	1-5	---	---
Snowberry	SYMPH	1-5	5-10	5-10	---	---
Serviceberry	AMELA	---	5-10	2-5	---	---
Common chokecherry	PRVI	---	---	20-30	---	---
Low sagebrush	ARAR8	---	---	---	25-30	---
Other shrubs	SSSS	5-10	5-10	10-15	10-20	---
Range site symbol		028B043N	028B029N	028B026N	028B037N	BARREN
Potential production (lb/acre):						
Favorable years		1,000	1,500	1,400	700	---
Normal years		800	900	1,000	500	---
Unfavorable years		600	700	700	300	---

480—Winu-Mosquet association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 7,800 to 9,500 feet
Climatic data (average annual):
Precipitation—about 16 inches
Air temperature—about 42 degrees F
Frost-free season—about 60 days

Composition

Winu gravelly loam, 15 to 50 percent slopes (Argic Pachic Cryoborolls - fine-loamy, mixed)—60 percent
Mosquet very stony loam, 30 to 50 percent slopes (Lithic Ruptic-Argic Cryoborolls - clayey, montmorillonitic)—30 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—4 percent
Inclusion 2: Argic Pachic Cryoborolls, 8 to 30 percent slopes—3 percent
Inclusion 3: Hackwood bouldery silty clay loam, 4 to 15 percent slopes (Pachic Cryoborolls - fine-loamy, mixed)—2 percent
Inclusion 4: Cumulic Cryaquolls, 2 to 8 percent slopes—1 percent

Winu Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum, colluvium; source—mixed volcanic rocks
Slope features: Length—long; shape—broad, concave
Dominant present vegetation: Mountain big sagebrush, lupine, Idaho fescue, mountain brome
Typical profile:
0 to 8 inches—gravelly loam; 25 to 50 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, CL-ML; estimated AASHTO classification - A-2, A-4
8 to 32 inches—gravelly loam, gravelly sandy clay loam, gravelly clay loam; 5 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, SC; estimated AASHTO classification - A-6
32 inches—unweathered bedrock
Range in depth to bedrock: 24 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 3.4 to 4.3 inches
Water supplying capacity: 15 to 16 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.20; T value—3; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—moderate
Potential frost action: Moderate

Mosquet Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—basalt, andesite, rhyolite
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, pine bluegrass, Sandberg bluegrass
Typical profile:
0 to 11 inches—very stony loam; 25 to 35 percent cobbles and stones and 35 to 45 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2, A-4
11 to 18 inches—cobbly sandy clay, gravelly clay, gravelly clay loam; 5 to 20 percent cobbles and stones and 30 to 40 percent pebbles (by weight); angular blocky structure; very hard, very firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, SC; estimated AASHTO classification - A-7
18 inches—unweathered bedrock
Range in depth to bedrock: 6 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 2.0 to 2.4 inches
Water supplying capacity: 11 to 13 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.10; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Inclusion 2: Position on landscape—concave side slopes of mountains; contrasting feature—receives additional moisture from drifted snow; distinctive present vegetation—common chokecherry, snowberry, serviceberry, Idaho fescue

Inclusion 3: Position on landscape—mainly north-facing concave side slopes of mountains; contrasting features—deep to bedrock, does not have a layer of clay accumulation; distinctive present vegetation—quaking aspen, snowberry, creeping barberry

Inclusion 4: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, wet; distinctive present vegetation—sedge, willow, tufted hairgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 69)

Elements of Wildlife Habitat

Suitability of Winu soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Suitability of Mosquet soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Winu Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Mosquet Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, large stones
Roadfill: Poor—depth to rock, slope, shrink-swell
Daily cover for landfill: Poor—depth to rock, too clayey, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—large stones, slope, shrink-swell
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Winu soil—VIIe, nonirrigated; Mosquet soil—VIIs, nonirrigated

Range site symbol: Winu soil—028B029N; Mosquet soil—028B038N

TABLE 69.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Winu	Mosquet	1	2	3	4
Idaho fescue	FEID	10-15	10-15	---	5-10	---	X
Bluebunch wheatgrass	AGSP	2-5	5-10	---	1-3	---	---
Letterman needlegrass	STLE4	5-10	2-5	---	---	---	---
Mountain brome	BRMA4	15-20	---	---	2-5	---	X
Columbia needlegrass	STCO3	2-5	---	---	---	---	---
Slender wheatgrass	AGTR	1-2	---	---	---	---	---
Basin wildrye	ELCI2	1-2	---	---	1-5	---	---
Spike-fescue	HEKI	5-10	---	---	---	---	---
Pine bluegrass	POSC	---	5-10	---	---	---	---
Thurber needlegrass	STTH2	---	2-5	---	---	---	---
Bottlebrush squirreltail	SIHY	---	2-5	---	---	---	---
Indian ricegrass	ORHY	---	2-5	---	---	---	---
Nevada bluegrass	PONE3	---	---	---	---	5-10	---
Tufted hairgrass	DECA5	---	---	---	---	30-60	---
Sedge	CAREX	---	---	---	---	5-10	---
Alpine timothy	PHAL2	---	---	---	---	5-10	---
Other perennial grasses	PPGG	5-10	10-15	---	5-15	2-10	---
Sierra clover	TRWO	---	---	---	---	2-5	---
Cinquefoil	POTEN	---	---	---	---	2-5	---
Other perennial forbs	PPFF	5-10	5-10	---	5-15	10-20	---
Mountain big sagebrush	ARTRV	10-20	---	---	1-5	---	X
Serviceberry	AMELA	5-10	---	---	2-5	---	---
Snowberry	SYMPH	5-10	2-5	---	5-10	---	---
Low sagebrush	ARAR8	---	20-35	---	---	---	---
Low rabbitbrush	CHVIH2	---	2-5	---	---	---	---
Horsebrush	TETRA3	---	2-5	---	---	---	---
Common chokecherry	PRVI	---	---	---	20-30	---	---
Willow	SALIX	---	---	---	---	2-5	---
Quaking aspen	POTR5	---	---	---	---	---	X
Other shrubs	SSSS	5-10	5-10	---	10-15	---	---
Range site symbol		028B029N	028B038N	BARREN	028B026N	025X005N	---
Woodland site symbol		---	---	---	---	---	025X065N
Potential production (lb/acre):							
Favorable years		1,500	800	---	1,400	2,000	800
Normal years		900	600	---	1,000	1,700	600
Unfavorable years		700	400	---	700	1,000	400

481—Winu-Spinlin association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 7,800 to 9,200 feet
Climatic data (average annual):
Precipitation—about 15 inches
Air temperature—about 42 degrees F
Frost-free season—about 60 days

Composition

Winu gravelly loam, 15 to 30 percent slopes (Argic Pachic Cryoborolls - fine-loamy, mixed)—45 percent
Spinlin extremely stony loam, 8 to 30 percent slopes (Argic Cryoborolls - clayey-skeletal, montmorillonitic)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Argic Pachic Cryoborolls, 8 to 30 percent slopes—8 percent
Inclusion 2: Cumulic Cryaquolls, drained, 2 to 8 percent slopes—3 percent
Inclusion 3: Rock outcrop—3 percent
Inclusion 4: Cumulic Cryaquolls, 2 to 8 percent slopes—1 percent

Winu Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum, colluvium; source—mixed volcanic rocks
Slope features: Length—long; shape—smooth to concave
Dominant present vegetation: Mountain big sagebrush, lupine, mountain brome, Idaho fescue, needleandthread
Typical profile:
0 to 8 inches—gravelly loam; 25 to 50 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, CL-ML; estimated AASHTO classification - A-2, A-4
8 to 32 inches—gravelly loam, gravelly sandy clay loam, gravelly clay loam; 5 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, SC; estimated AASHTO classification - A-6
32 inches—unweathered bedrock
Range in depth to bedrock: 24 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 3.4 to 4.3 inches
Water supplying capacity: 15 to 16 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.20; T value—3; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—moderate
Potential frost action: Moderate

Spinlin Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum, colluvium; source—rhyolite, quartzite, andesite
Slope features: Length—short; shape—smooth to convex
Dominant present vegetation: Low sagebrush, Idaho fescue, bluebunch wheatgrass, needleandthread
Typical profile:
0 to 10 inches—extremely stony loam; 35 to 50 percent cobbles and stones and 40 to 50 percent pebbles (by weight); subangular blocky structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2, A-4, A-6
10 to 32 inches—very cobbly clay, very gravelly clay; 30 to 45 percent cobbles and stones and 30 to 55 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, SC; estimated AASHTO classification - A-7
32 inches—weathered bedrock
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 3.3 to 4.0 inches
Water supplying capacity: 12 to 14 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—concave lower side slopes of mountains; contrasting features—deep to bedrock, receives additional moisture from drifted snow; distinctive present vegetation—common chokecherry, snowberry, serviceberry, Idaho fescue
Inclusion 2: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, moderately wet; distinctive present vegetation—sedge, willow
Inclusion 3: Position on landscape—convex crests and side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren
Inclusion 4: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, wet; distinctive present vegetation—meadow grasses

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 70)

Elements of Wildlife Habitat

Suitability of Winu soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Spinlin soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Winu Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Spinlin Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—depth to rock, shrink-swell
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Winu soil—VIe, nonirrigated; Spinlin soil—VIIs, nonirrigated
Range site symbol: Winu soil—028B029N; Spinlin soil—028B037N

TABLE 70.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Winu	Spinlin	1	2	3	4
Idaho fescue	FEID	10-15	2-5	5-10	---	---	---
Bluebunch wheatgrass	AGSP	2-5	5-10	1-3	---	---	---
Letterman needlegrass	STLE4	5-10	---	---	---	---	---
Mountain brome	BRMA4	15-20	---	2-5	---	---	---
Columbia needlegrass	STCO3	2-5	---	---	---	---	---
Slender wheatgrass	AGTR	1-2	---	---	---	---	---
Basin wildrye	ELCI2	1-2	---	1-5	30-50	---	---
Spike-fescue	HEKI	5-10	---	---	---	---	---
Indian ricegrass	ORHY	---	2-5	---	---	---	---
Pine bluegrass	POSC	---	5-10	---	---	---	---
Thurber needlegrass	STTH2	---	2-5	---	---	---	---
Bottlebrush squirreltail	SIHY	---	2-5	---	---	---	---
Western wheatgrass	AGSM	---	---	---	5-10	---	---
Nevada bluegrass	PONE3	---	---	---	5-10	---	5-10
Tufted hairgrass	DECA5	---	---	---	---	---	30-60
Sedge	CAREX	---	---	---	---	---	5-10
Alpine timothy	PHAL2	---	---	---	---	---	5-10
Other perennial grasses	PPGG	5-10	10-15	5-15	5-15	---	2-10
Sierra clover	TRWO	---	---	---	---	---	2-5
Cinquefoil	POTEN	---	---	---	---	---	2-5
Other perennial forbs	PPFF	5-10	10-15	5-15	5-10	---	10-20
Mountain big sagebrush	ARTRV	10-20	---	1-5	1-2	---	---
Serviceberry	AMELA	5-10	---	2-5	---	---	---
Snowberry	SYMPH	5-10	---	5-10	---	---	---
Low sagebrush	ARAR8	---	25-30	---	---	---	---
Common chokecherry	PRVI	---	---	20-30	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	5-10	---	---
Rubber rabbitbrush	CHNA2	---	---	---	2-5	---	---
Willow	SALIX	---	---	---	---	---	2-5
Other shrubs	SSSS	5-10	10-20	10-15	5-10	---	---

Range site symbol	028B029N	028B037N	028B026N	028B024N	BARREN	025X005N
Potential production (lb/acre):						
Favorable years	1,500	700	1,400	2,800	---	2,000
Normal years	900	500	1,000	1,700	---	1,700
Unfavorable years	700	300	700	1,000	---	1,000

491—Rock outcrop-Labshaft association

Map Unit Setting

Positions on landscape: Crest and side slopes of mountains
Elevation: 7,500 to 10,000 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 43 degrees F
Frost-free season—about 50 days

Composition

Rock outcrop—55 percent
Labshaft very stony loam, 15 to 50 percent slopes (Lithic Cryoborolls - loamy-skeletal, mixed)—35 percent
Contrasting inclusions as follows:
Inclusion 1: Argic Pachic Cryoborolls, 8 to 30 percent slopes—7 percent
Inclusion 2: Foxmount loam, 15 to 50 percent slopes (Typic Cryoborolls - loamy-skeletal, mixed)—3 percent

Rock Outcrop

Positions on landscape: Crests and side slopes of mountains
Slope features: Length—short; shape—convex
Dominant present vegetation: Barren

Labshaft Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—quartzite
Slope features: Length—short; shape—smooth to convex
Dominant present vegetation: Curlleaf mountainmahogany, mountain big sagebrush, Idaho fescue, sparse singleleaf pinyon and Utah juniper
Typical profile:
0 to 5 inches—very stony loam; 15 to 25 percent cobbles and stones and 25 to 40 percent pebbles (by weight); granular structure; soft, very friable; slightly acid (pH 6.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, CL, GC; estimated AASHTO classification - A-2, A-6
5 to 11 inches—very gravelly loam, very gravelly clay loam, extremely gravelly sandy clay loam; 15 to 25 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
11 inches—unweathered bedrock
Range in depth to bedrock: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 1.1 to 1.3 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.17; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—concave lower side slopes of mountains; contrasting features—deep, layer of clay accumulation, receives additional moisture from drifted snow; distinctive present vegetation—common chokecherry, snowberry, serviceberry, Idaho fescue
Inclusion 2: Position on landscape—smooth to slightly concave upper side slopes of mountains; contrasting feature—moderately deep to bedrock; distinctive present vegetation—curlleaf mountainmahogany

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 71)

Elements of Wildlife Habitat

Suitability of Labshaft soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Labshaft Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, large stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 71.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Rock outcrop	Labshaft	1	2
Pine bluegrass	POSC	---	2-5	---	5-10
Thurber needlegrass	STTH2	---	2-5	---	10-15
Idaho fescue	FEID	---	5-15	5-10	1-2
Bluebunch wheatgrass	AGSP	---	5-10	1-3	10-20
Columbia needlegrass	STCO3	---	5-10	---	---
Western needlegrass	STOC2	---	5-10	---	---
Letterman needlegrass	STLE4	---	2-5	---	---
Mountain brome	BRMA4	---	---	2-5	---
Basin wildrye	ELCI2	---	---	1-5	1-5
Indian ricegrass	ORHY	---	---	---	2-5
Other perennial grasses	PPGG	---	5-10	5-15	2-4
Perennial forbs	PPFF	---	10-15	5-15	10-20
Mountainmahogany	CERCO	---	5-10	---	---
Mountain big sagebrush	ARTRV	---	5-10	1-5	5-10
Snowberry	SYMPH	---	1-5	5-10	1-5
Serviceberry	AMELA	---	---	2-5	---
Common chokecherry	PRVI	---	---	20-30	---
Curlleaf mountainmahogany	CELE3	---	---	---	5-10
Other shrubs	SSSS	---	5-10	10-15	5-10
Range site symbol		BARREN	028B043N	028B026N	028B042N
Potential production (lb/acre):					
Favorable years		---	1,000	1,400	900
Normal years		---	800	1,000	600
Unfavorable years		---	600	700	400

Interpretive Groups

Capability classification: Rock outcrop—VIIIs, nonirrigated; Labshaft soil—VIIs, nonirrigated

Range site symbol: Labshaft soil—028B043N

492—Rock outcrop-Winu-Decram association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 7,500 to 9,000 feet
Climatic data (average annual):
Precipitation—about 18 inches
Air temperature—about 42 degrees F
Frost-free season—about 50 days

Composition

Rock outcrop—45 percent
Winu gravelly loam, 15 to 30 percent slopes (Argic Pachic Cryoborolls - fine-loamy, mixed)—25 percent
Decram very stony loam, 30 to 50 percent slopes (Typic Cryoborolls - loamy-skeletal, mixed)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Labshaft very stony loam, 8 to 30 percent slopes (Lithic Cryoborolls - loamy-skeletal, mixed)—10 percent
Inclusion 2: Argic Pachic Cryoborolls, 8 to 30 percent slopes—5 percent

Rock Outcrop

Positions on landscape: Crests and upper side slopes of mountains
Slope features: Length—short; shape—convex
Dominant present vegetation: Barren

Winu Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum, colluvium; source—volcanic rock
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Mountain big sagebrush, basin wildrye, Idaho fescue, mountain brome
Typical profile:
0 to 8 inches—gravelly loam; 25 to 50 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, CL-ML; estimated AASHTO classification - A-2, A-4
8 to 32 inches—gravelly loam, gravelly sandy clay loam, gravelly clay loam; 5 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, SC; estimated AASHTO classification - A-6
32 inches—unweathered bedrock
Range in depth to bedrock: 24 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 3.4 to 4.3 inches
Water supplying capacity: 15 to 16 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.20; T value—3; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—moderate
Potential frost action: Moderate

Decram Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—andesite, quartzite, chert
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Black sagebrush, low sagebrush, Idaho fescue, pine bluegrass
Typical profile:
0 to 10 inches—very stony loam; 15 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
10 to 39 inches—very gravelly loam, very cobbly loam, extremely gravelly loam; 15 to 55 percent cobbles and stones and 40 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-6
39 inches—unweathered bedrock
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 1.6 to 2.3 inches
Water supplying capacity: 12 to 14 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.10; T value—2; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight

Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex shoulders of mountains near areas of Rock outcrop; contrasting features—shallow to bedrock, does not have a layer of clay accumulation; distinctive present vegetation—curlleaf mountainmahogany
Inclusion 2: Position on landscape—concave north-facing side slopes of mountains; contrasting features—deep to bedrock, receives additional moisture from drifted snow; distinctive present vegetation—common chokecherry, snowberry, serviceberry, Idaho fescue

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 72)

Elements of Wildlife Habitat

Suitability of Winu soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Decram soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Winu Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Decram Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones
Roadfill: Poor—depth to rock, large stones, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, large stones, slope
Local roads and streets: Severe—slope, large stones
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Interpretive Groups

Capability classification: Rock outcrop—VIIIs, nonirrigated; Winu soil—VIs, nonirrigated; Decram soil—VIIs, nonirrigated
Range site symbol: Winu soil—028B029N; Decram soil—028B038N

TABLE 72.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Rock outcrop	Winu	Decram	1	2
Idaho fescue	FEID	---	10-15	10-15	5-10	5-15
Bluebunch wheatgrass	AGSP	---	2-5	5-10	1-3	5-10
Letterman needlegrass	STLE4	---	5-10	2-5	---	2-5
Mountain brome	BRMA4	---	15-20	---	2-5	---
Columbia needlegrass	STCO3	---	2-5	---	---	5-10
Slender wheatgrass	AGTR	---	1-2	---	---	---
Basin wildrye	ELCI2	---	1-2	---	1-5	---
Spike-fescue	HEKI	---	5-10	---	---	---
Pine bluegrass	POSC	---	---	5-10	---	2-5
Thurber needlegrass	STTH2	---	---	2-5	---	2-5
Bottlebrush squirreltail	SIHY	---	---	2-5	---	---
Indian ricegrass	ORHY	---	---	2-5	---	---
Western needlegrass	STOC2	---	---	---	---	5-10
Other perennial grasses	PPGG	---	5-10	10-15	5-15	5-10
Perennial forbs	PPFF	---	5-10	5-10	5-15	10-15
Mountain big sagebrush	ARTRV	---	10-20	---	1-5	5-10
Serviceberry	AMELA	---	5-10	---	2-5	---
Snowberry	SYMPH	---	5-10	2-5	5-10	1-5
Low sagebrush	ARAR8	---	---	20-35	---	---
Low rabbitbrush	CHVIH2	---	---	2-5	---	---
Horsebrush	TETRA3	---	---	2-5	---	---
Common chokecherry	PRVI	---	---	---	20-30	---
Mountainmahogany	CERCO	---	---	---	---	5-10
Other shrubs	SSSS	---	5-10	5-10	10-15	5-10

Range site symbol	BARREN	028B029N	028B038N	028B026N	028B043N
Potential production (lb/acre):					
Favorable years	---	1,500	800	1,400	1,000
Normal years	---	900	600	1,000	800
Unfavorable years	---	700	400	700	600

501—Hymas-Ansping association

Map Unit Setting

Positions on landscape: Side slopes of mountains bordering mountain-valley fans
Elevation: 6,800 to 7,400 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Hymas cobbly loam, 15 to 30 percent slopes (Lithic Haploxerolls - loamy-skeletal, carbonatic, frigid)—55 percent
Ansping loam, 15 to 30 percent slopes (Aridic Calcixerolls - loamy-skeletal, carbonatic, frigid)—30 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—5 percent
Inclusion 2: Cumulic Haploxerolls, 2 to 8 percent slopes—5 percent
Inclusion 3: Aridic Calcic Argixerolls, 4 to 15 percent slopes—5 percent

Hymas Soil

Positions on landscape: Upper side slopes of mountains
Parent material: Kind—residuum; source—limestone, calcareous shale
Slope features: Length—long; shape—smooth to convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, mountain brome, bluegrass, Thurber needlegrass
Typical profile:
0 to 3 inches—cobbly loam; 15 to 35 percent cobbles and stones and 10 to 30 percent pebbles (by weight); granular structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML, GM, SM; estimated AASHTO classification - A-4
3 to 12 inches—very cobbly loam, extremely gravelly loam, extremely cobbly loam, very gravelly loam; 30 to 70 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2
12 inches—unweathered bedrock
Range in depth to bedrock: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 0.8 to 1.4 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.32; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Ansping Soil

Positions on landscape: Lower side slopes of mountains
Parent material: Kind—colluvium; source—limestone
Slope features: Length—long; shape—smooth
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, rabbitbrush
Typical profile:
0 to 13 inches—loam; 0 to 25 percent pebbles (by weight); granular structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
13 to 43 inches—very gravelly loam, very gravelly sandy loam, extremely gravelly loam; 5 to 10 percent cobbles and stones and 65 to 85 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GP-GC; estimated AASHTO classification - A-2
43 to 60 inches—cemented hardpan
Range in depth to hardpan: 40 to 55 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the cemented hardpan—moderate
Available water capacity: 4.2 to 5.0 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.37; T value—3; wind erodibility group—5
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests and middle and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Inclusion 2: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, thick and dark-colored upper layer; distinctive present vegetation—basin big sagebrush, basin wildrye

Inclusion 3: Position on landscape—smooth adjacent mountain-valley fan remnants; contrasting feature—layer of clay accumulation; distinctive present vegetation—singleleaf pinyon, Utah juniper, big sagebrush

Major Uses

Rangeland, wildlife habitat, woodland

Potential Native Plant Community (Table 73)

TABLE 73.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Hymas	Ansping	1	2	3
Indian ricegrass	ORHY	X	X	---	---	X
Needleandthread	STCO4	X	X	---	---	X
Pine bluegrass	POSC	X	X	---	---	X
Bluebunch wheatgrass	AGSP	X	X	---	---	X
Nevada bluegrass	PONE3	X	X	---	5-10	X
Thurber needlegrass	STTH2	X	X	---	---	X
Bottlebrush squirreltail	SIHY	X	X	---	---	X
Sandberg bluegrass	POSE	X	X	---	---	X
Basin wildrye	ELCI2	---	---	---	30-50	---
Western wheatgrass	AGSM	---	---	---	5-10	---
Other perennial grasses	PPGG	X	X	---	5-15	X
Perennial forbs	PPFF	X	X	---	5-10	X
Big sagebrush	ARTR2	X	X	---	---	X
Utah juniper	JUOS	X	X	---	---	X
Singleleaf pinyon	PIMO	X	X	---	---	X
Basin big sagebrush	ARTRT*	---	---	---	5-10	---
Mountain big sagebrush	ARTRV	---	---	---	1-2	---
Rubber rabbitbrush	CHNA2	---	---	---	2-5	---
Other shrubs	SSSS	X	X	---	5-10	X
Range site symbol		---	---	BARREN	028B024N	---
Woodland site symbol		025X062N	025X062N	---	---	025X062N
Potential production (lb/acre):						
Favorable years		500	500	---	2,800	500
Normal years		300	300	---	1,700	300
Unfavorable years		250	250	---	1,000	250

Woodland

Hymas Soil

Site index for common trees: Singleleaf pinyon—40; Utah juniper—40
Most important native understory plants: Basin wildrye, bluebunch wheatgrass, Thurber needlegrass, big sagebrush

Ansping Soil

Site index for common trees: Singleleaf pinyon—75; Utah juniper—75
Most important native understory plants: Basin wildrye, bluebunch wheatgrass, Thurber needlegrass, big sagebrush

Elements of Wildlife Habitat

Suitability of Hymas soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Ansping soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Hymas Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, erodes easily
Roadfill: Poor—depth to rock, large stones, slope
Daily cover for landfill: Poor—depth to rock, large stones, slope
Shallow excavations: Severe—depth to rock, large stones, slope
Local roads and streets: Severe—depth to rock, slope, large stones
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Ansping Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Fair—cemented pan, slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Hymas soil—VIIs, nonirrigated; Ansping soil—VIe, nonirrigated
Woodland suitability group: Hymas soil—3d; Ansping soil—2o

511—Ansping-Hymas association

Map Unit Setting

Positions on landscape: Side slopes of mountains bordering mountain-valley fans
Elevation: 6,500 to 8,000 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Ansping loam, 4 to 15 percent slopes (Aridic Calcixerolls - loamy-skeletal, carbonatic, frigid)—60 percent
Hymas cobbly loam, 15 to 30 percent slopes (Lithic Haploxerolls - loamy-skeletal, carbonatic, frigid)—25 percent
Contrasting inclusions as follows:
Inclusion 1: Aridic Calcic Haploxerolls, 4 to 15 percent slopes—10 percent
Inclusion 2: Cumulic Haplaquolls, drained, 2 to 8 percent slopes—3 percent
Inclusion 3: Rock outcrop—2 percent

Ansping Soil

Positions on landscape: Lower side slopes and foot slopes of mountains
Parent material: Kind—alluvium, colluvium; source—limestone
Slope features: Length—short; shape—smooth
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, rabbitbrush, bottlebrush squirreltail
Typical profile:
0 to 13 inches—loam; 0 to 25 percent pebbles (by weight); granular structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
13 to 43 inches—very gravelly loam, very gravelly sandy loam, extremely gravelly loam; 5 to 10 percent cobbles and stones and 65 to 85 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GP-GC; estimated AASHTO classification - A-2
43 to 60 inches—cemented hardpan
Range in depth to hardpan: 40 to 55 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the cemented hardpan—moderate
Available water capacity: 4.2 to 5.0 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.37; T value—3; wind erodibility group—5
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Hymas Soil

Positions on landscape: Upper side slopes of mountains
Parent material: Kind—residuum; source—limestone, calcareous shale
Slope features: Length—long; shape—smooth to convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, rabbitbrush, bottlebrush squirreltail
Typical profile:
0 to 3 inches—cobbly loam; 15 to 35 percent cobbles and stones and 10 to 30 percent pebbles (by weight); granular structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML, GM, SM; estimated AASHTO classification - A-4
3 to 12 inches—very cobbly loam, extremely gravelly loam, extremely cobbly loam, very gravelly loam; 30 to 70 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2
12 inches—unweathered bedrock
Range in depth to bedrock: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 0.8 to 1.4 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.32; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth to concave adjacent mountain-valley fans; contrasting features—very deep, less than 40 percent calcium carbonate equivalent; distinctive present vegetation—big sagebrush, grasses
Inclusion 2: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, thick and dark-colored upper layer; distinctive present vegetation—basin big sagebrush, rabbitbrush, basin wildrye
Inclusion 3: Position on landscape—convex crests and side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat, woodland

Potential Native Plant Community (Table 74)

Woodland

Ansping Soil

Site index for common trees: Singleleaf pinyon—75; Utah juniper—75
Most important native understory plants: Bluebunch wheatgrass, basin wildrye, Thurber needlegrass, big sagebrush

Hymas Soil

Site index for common trees: Singleleaf pinyon—40; Utah juniper—40
Most important native understory plants: Bluebunch wheatgrass, basin wildrye, Thurber needlegrass, big sagebrush

Elements of Wildlife Habitat

Suitability of Ansping soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Suitability of Hymas soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Ansping Soil

Suitability and limitations for the following uses:
Rangeland seeding: Good
Roadfill: Fair—cemented pan
Daily cover for landfill: Poor—small stones
Shallow excavations: Moderate—slope
Local roads and streets: Moderate—slope, frost action
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Hymas Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, erodes easily
Roadfill: Poor—depth to rock, large stones, slope
Daily cover for landfill: Poor—depth to rock, large stones, slope
Shallow excavations: Severe—depth to rock, large stones, slope
Local roads and streets: Severe—depth to rock, slope, large stones
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Ansping soil—IVe, irrigated, and VIs, nonirrigated; Hymas soil—VIIs, nonirrigated
Woodland suitability group: Ansping soil—2o; Hymas soil—3d

TABLE 74.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Ansping	Hymas	1	2	3
Indian ricegrass	ORHY	X	X	---	---	---
Needleandthread	STCO4	X	X	---	---	---
Pine bluegrass	POSC	X	X	2-5	---	---
Bluebunch wheatgrass	AGSP	X	X	10-20	---	---
Nevada bluegrass	PONE3	X	X	---	5-10	---
Thurber needlegrass	STTH2	X	X	5-10	---	---
Bottlebrush squirreltail	SIHY	X	X	---	---	---
Sandberg bluegrass	POSE	X	X	---	---	---
Basin wildrye	ELCI2	---	---	2-5	30-50	---
Idaho fescue	FEID	---	---	2-5	---	---
Western wheatgrass	AGSM	---	---	1-5	5-10	---
Other perennial grasses	PPGG	X	X	10-20	5-15	---
Perennial forbs	PPFF	X	X	5-12	5-10	---
Big sagebrush	ARTR2	X	X	---	---	---
Utah juniper	JUOS	X	X	---	---	---
Singleleaf pinyon	PIMO	X	X	---	---	---
Serviceberry	AMELA	---	---	2-10	---	---
Antelope bitterbrush	PUTR2	---	---	5-10	---	---
Horsebrush	TETRA3	---	---	1-2	---	---
Mountain big sagebrush	ARTRV	---	---	15-25	1-2	---
Basin big sagebrush	ARTRT*	---	---	---	5-10	---
Rubber rabbitbrush	CHNA2	---	---	---	2-5	---
Other shrubs	SSSS	X	X	5-15	5-10	---
Range site symbol		---	---	028B030N	028B024N	BARREN
Woodland site symbol		025X062N	025X062N	---	---	---
Potential production (lb/acre):						
Favorable years		500	500	1,100	2,800	---
Normal years		300	300	800	1,700	---
Unfavorable years		250	250	600	1,000	---

521—Soughe Variant-Pie Creek-Singletree association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 5,500 to 7,000 feet
Climatic data (average annual):
Precipitation—about 11 inches
Air temperature—about 43 degrees F
Frost-free season—about 90 days

Composition

Soughe Variant gravelly loam, 30 to 50 percent slopes (Xerollic Haplargids - clayey, montmorillonitic, frigid, shallow)—50 percent
Pie Creek very cobbly loam, 15 to 30 percent slopes (Aridic Palexerolls - very-fine, montmorillonitic, frigid)—20 percent
Singletree gravelly loam, 15 to 30 percent slopes (Aridic Calcic Argixerolls - fine-loamy, mixed, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Cumulic Haplaquolls, 2 to 4 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—3 percent
Inclusion 2: Cumulic Haplaquolls, drained, 2 to 4 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—3 percent
Inclusion 3: Aridic Argixerolls, 2 to 8 percent slopes (Aridic Argixerolls - loamy-skeletal, mixed, frigid)—2 percent
Inclusion 4: Rock outcrop—2 percent

Soughe Variant Soil

Positions on landscape: South-, east-, and west-facing crests and side slopes of mountains
Parent material: Kind—residuum; source—calcareous tuff, shale, sandstone
Slope features: Length—long; shape—convex
Dominant present vegetation: Singleleaf pinyon, big sagebrush, rabbitbrush, arrowleaf balsamroot, Nevada bluegrass, basin wildrye
Typical profile:
0 to 4 inches—gravelly loam; 0 to 10 percent cobbles and stones and 20 to 30 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, CL; estimated AASHTO classification - A-6
4 to 19 inches—gravelly clay; 0 to 10 percent cobbles and stones and 30 to 50 percent pebbles (by weight); prismatic structure; very hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
19 to 33 inches—weathered bedrock
33 inches—unweathered bedrock
Range in depth to bedrock: 12 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 1.4 to 2.4 inches
Water supplying capacity: 9 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—1; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Pie Creek Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—tuff
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush
Typical profile:
0 to 8 inches—very cobbly loam; 40 to 50 percent cobbles and stones and 10 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4
8 to 15 inches—clay; 0 to 10 percent pebbles (by weight); prismatic structure; very hard, very firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CH; estimated AASHTO classification - A-7
15 to 23 inches—clay loam, clay; 0 to 10 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL; estimated AASHTO classification - A-7
23 inches—unweathered bedrock
Range in depth to bedrock: 23 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 3.5 to 4.1 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid

Hydrologic group: D
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Singletree Soil

Positions on landscape: North-facing and lower east-facing side slopes of mountains
Parent material: Kind—residuum, colluvium; source—andesite influenced by loess and volcanic ash
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Big sagebrush, antelope bitterbrush, serviceberry, rabbitbrush, arrowleaf balsamroot, Idaho fescue
Typical profile:
0 to 15 inches—gravelly loam; 25 to 40 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-4
15 to 35 inches—loam, gravelly loam, clay loam; 0 to 15 percent cobbles and stones and 20 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, GC, CL; estimated AASHTO classification - A-6
35 to 57 inches—sandy loam, sandy clay loam, gravelly sandy loam; 0 to 15 percent cobbles and stones and 20 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2
57 inches—weathered bedrock
Range in depth to bedrock: 45 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 7.2 to 9.4 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.32; T value—4; wind erodibility group—5
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, poorly drained, thick and dark-colored upper layer; distinctive present vegetation—tufted hairgrass
Inclusion 2: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, somewhat poorly drained, thick and dark-colored upper layer; distinctive present vegetation—basin wildrye
Inclusion 3: Position on landscape—lower side slopes of mountains; contrasting features—very gravelly throughout the profile, layer of clay accumulation at a depth of 2 to 8 inches; distinctive present vegetation—big sagebrush, Idaho fescue
Inclusion 4: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 75)

Woodland

Soughe Variant Soil

Site index for common trees: Singleleaf pinyon—30; Utah juniper—30
Most important native understory plants: Bluebunch wheatgrass, Idaho fescue, Thurber needlegrass, antelope bitterbrush, big sagebrush

Elements of Wildlife Habitat

Suitability of Soughe Variant soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Pie Creek soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Singletree soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Soughe Variant Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, erodes easily
Roadfill: Poor—depth to rock, low strength, slope
Daily cover for landfill: Poor—depth to rock, too clayey, hard to pack
Shallow excavations: Severe—depth to rock, slope

TABLE 75.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Soughe Variant	Pie Creek	Singletree	1	2	3	4
Indian ricegrass	ORHY	X	---	---	---	---	---	---
Needleandthread	STCO4	X	---	---	---	---	---	---
Pine bluegrass	POSC	X	2-10	---	---	---	1-2	---
Bluebunch wheatgrass	AGSP	X	15-40	15-30	---	---	15-40	---
Nevada bluegrass	PONE3	X	---	2-5	5-10	5-10	---	---
Thurber needlegrass	STTH2	X	15-40	T-10	---	---	---	---
Bottlebrush squirreltail	SIHY	X	2-5	---	---	---	---	---
Sandberg bluegrass	POSE	X	2-10	---	---	---	---	---
Webber ricegrass	ORWE	---	5-15	---	---	---	---	---
Basin wildrye	ELCI2	---	1-5	5-10	---	50-60	2-5	---
Idaho fescue	FEID	---	2-5	15-40	---	---	20-40	---
Tufted hairgrass	DECA5	---	---	---	30-60	---	---	---
Sedge	CAREX	---	---	---	5-10	1-5	---	---
Alpine timothy	PHAL2	---	---	---	5-10	---	---	---
Mat muhly	MURI	---	---	---	---	2-5	---	---
Other perennial grasses	PPGG	X	---	5-10	2-10	15-20	2-5	---
Hawksbeard	CREPI	---	---	1-5	---	---	---	---
Arrowleaf balsamroot	BASA3	---	---	5-10	---	---	2-5	---
Sierra clover	TRWO	---	---	---	2-5	---	---	---
Cinquefoil	POTEN	---	---	---	2-5	---	---	---
Lupine	LUPIN	---	---	---	---	2-5	2-5	---
Other perennial forbs	PPFF	X	5-10	5-15	10-20	5-10	2-10	---
Big sagebrush	ARTR2	X	---	---	---	---	5-15	---
Utah juniper	JUOS	X	---	---	---	---	---	---
Singleleaf pinyon	PIMO	X	---	---	---	---	---	---
Antelope bitterbrush	PUTR2	---	T-5	5-15	---	---	---	---
Douglas rabbitbrush	CHVI8	---	2-5	---	---	---	---	---
Low sagebrush	ARAR8	---	15-25	---	---	---	---	---
Mountain big sagebrush	ARTRV	---	---	10-15	---	---	---	---
Willow	SALIX	---	---	---	2-5	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	10-15	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5	---	---
Rabbitbrush	CHRYS9	---	---	---	---	---	2-5	---
Other shrubs	SSSS	X	---	5-15	---	---	---	---
Range site symbol		---	025X018N	025X012N	025X005N	025X003N	025X027N	BARREN
Woodland site symbol		025X062N	---	---	---	---	---	---
Potential production (lb/acre):								
Favorable years		500	800	1,200	2,000	2,500	1,300	---
Normal years		300	600	900	1,700	1,900	900	---
Unfavorable years		250	400	600	1,000	1,200	600	---

Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Pie Creek Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones, rooting depth
Roadfill: Poor—depth to rock, low strength
Daily cover for landfill: Poor—depth to rock, too clayey, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Singletree Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Soughe Variant soil—VIIe, nonirrigated; Pie Creek soil—VIIs, nonirrigated; Singletree soil—VIIe, nonirrigated
Range site symbol: Pie Creek soil—025X018N; Singletree soil—025X012N
Woodland suitability group: Soughe Variant soil—3r

525—Soughe-Fortank-Kodra Variant association

Map Unit Setting

Positions on landscape: Crest and side slopes of hills
Elevation: 4,800 to 6,000 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 45 degrees F
Frost-free season—about 95 days

Composition

Soughe very gravelly loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids - loamy-skeletal, mixed, mesic)—45 percent
Fortank gravelly loam, 15 to 30 percent slopes (Xerollic Haplargids - fine, montmorillonitic, frigid)—30 percent
Kodra Variant gravelly loam, 15 to 30 percent slopes (Typic Durorthids - loamy, mixed, mesic, shallow)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Rubble land—2 percent
Inclusion 2: Rock outcrop—2 percent
Inclusion 3: Soughe very gravelly loam, 50 to 75 percent slopes (Lithic Xerollic Haplargids - loamy-skeletal, mixed, mesic)—1 percent

Soughe Soil

Positions on landscape: Southeast-facing and lower west-facing side slopes of hills
Parent material: Kind—residuum; source—quartzite, shale, conglomerate, tuff, altered andesite
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Wyoming big sagebrush, Douglas rabbitbrush
Typical profile:
0 to 7 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2
7 to 12 inches—very gravelly sandy clay loam, very gravelly clay loam, very gravelly loam; 0 to 15 percent cobbles and stones and 45 to 75 percent pebbles (by weight); subangular blocky structure; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, SC; estimated AASHTO classification - A-2
12 inches—unweathered bedrock
Range in depth to bedrock: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 0.7 to 1.0 inch
Water supplying capacity: 7 to 9 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.10; T value—1; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Fortank Soil

Positions on landscape: North- and west-facing side slopes of hills
Parent material: Kind—residuum; source—andesite, quartzite, rhyolite
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Wyoming big sagebrush, cheatgrass, spiny hopsage
Typical profile:
0 to 10 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-2, A-4
10 to 35 inches—gravelly clay, gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC, CL; estimated AASHTO classification - A-7
35 inches—weathered bedrock
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 3.4 to 4.3 inches
Water supplying capacity: 7.5 to 9.5 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.20; T value—2; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight

Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Kodra Variant Soil

Positions on landscape: Crests and upper side slopes of hills
Parent material: Kind—residuum; source—chert, quartzite, tuffaceous sandstone
Slope features: Length—short; shape—convex
Dominant present vegetation: Bud sagebrush, shadscale, spiny horsebrush, mustard, cheatgrass, bottlebrush squirreltail
Typical profile:
0 to 6 inches—gravelly loam; 25 to 40 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
6 to 18 inches—gravelly loam; 25 to 40 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
18 to 19 inches—indurated hardpan
19 inches—unweathered bedrock
Range in depth to hardpan: 12 to 19 inches
Range in depth to bedrock: 14 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderately slow
Available water capacity: 1.8 to 2.3 inches
Water supplying capacity: 4 to 6 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.28; T value—1; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—areas immediately below rock outcrops; contrasting feature—more than 90 percent of surface covered with stones; distinctive present vegetation—barren
Inclusion 2: Position on landscape—convex crests and barren upper side slopes of hills; contrasting feature—exposed bedrock at surface; distinct present vegetation—barren
Inclusion 3: Position on landscape—upper side slopes of hills; contrasting feature—slopes of more than 50 percent; distinctive present vegetation—Wyoming big sagebrush, Douglas rabbitbrush, lupine, cheatgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 76)

Elements of Wildlife Habitat

Suitability of Soughe soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—poor
Suitability of Fortank soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Kodra Variant soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Soughe Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Fortank Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty
Roadfill: Poor—depth to rock, low strength
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Kodra Variant Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—depth to rock

TABLE 76.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Soughe	Fortank	Kodra Variant	1	2	3
Bluebunch wheatgrass	AGSP	10-40	10-40	---	10-40	---	---
Thurber needlegrass	STTH2	10-40	10-40	---	10-40	---	---
Basin wildrye	ELCI2	5-15	5-15	---	5-15	---	---
Indian ricegrass	ORHY	2-10	2-10	5-15	2-10	---	---
Webber ricegrass	ORWE	2-10	2-10	---	2-10	---	---
Bluegrass	POA++	2-10	2-10	2-5	2-10	---	---
Bottlebrush squirreltail	SIHY	---	---	5-10	---	---	---
Other perennial grasses	PPGG	5-10	5-10	---	5-10	---	---
Globemallow	SPHAE	---	---	2-3	---	---	---
Other perennial forbs	PPFF	5-10	5-10	2-4	5-10	---	---
Big sagebrush	ARTR2	10-15	10-15	---	10-15	---	---
Shadscale	ATCO	---	---	30-35	---	---	---
Bud sagebrush	ARSP5	---	---	25-30	---	---	---
Other shrubs	SSSS	5-15	5-15	2-5	5-15	---	---
Range site symbol		025X019N	025X019N	024X002N	025X019N	BARREN	BARREN
Potential production (lb/acre):							
Favorable years		800	800	700	800	---	---
Normal years		600	600	450	600	---	---
Unfavorable years		400	400	300	400	---	---

Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, cemented pan, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, cemented pan, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Soughe soil—VIIs, nonirrigated; Fortank soil—VIIe, nonirrigated; Kodra Variant soil—VIIe, nonirrigated
Range site symbol: Soughe soil—025X019N; Fortank soil—025X019N; Kodra Variant soil—024X002N

531—Granzan Variant-Granzan-Highams Variant association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 7,000 to 9,000 feet
Climatic data (average annual):
Precipitation—about 16 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Granzan Variant very gravelly loam, 30 to 75 percent slopes (Typic Calcixerolls - loamy-skeletal, mixed, frigid)—40 percent
Granzan very gravelly loam, 30 to 75 percent slopes (Typic Calcixerolls - loamy-skeletal, carbonatic, frigid—35 percent
Highams Variant very gravelly loam, 30 to 50 percent slopes (Xerollic Calciorthids - loamy-skeletal, carbonatic, frigid, shallow)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Pachic Cryoborolls, 30 to 75 percent slopes (Pachic Cryoborolls - fine-loamy, mixed)—4 percent
Inclusion 2: Rock outcrop—3 percent
Inclusion 3: Lithic Argixerolls, 30 to 75 percent slopes (Lithic Argixerolls - loamy-skeletal, mixed, frigid)—3 percent

Granzan Variant Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—limestone, calcareous shale
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Curlleaf mountainmahogany, big sagebrush, snowberry, Indian ricegrass, basin wildrye
Typical profile:
0 to 14 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
14 to 36 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
36 to 50 inches—weathered bedrock
50 inches—unweathered bedrock
Range in depth to bedrock: 26 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 2.9 to 4.0 inches
Water supplying capacity: 11 to 13 inches
Runoff: Very rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Granzan Soil

Positions on landscape: Dominantly south-facing side slopes of mountains
Parent material: Kind—residuum, colluvium; source—limestone, calcareous shale
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Big sagebrush, snowberry, currant, lupine, basin wildrye, Sandberg bluegrass
Typical profile:
0 to 14 inches—very gravelly loam; 0 to 25 percent cobbles and stones and 40 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2
14 to 49 inches—very gravelly loam, very gravelly silt loam; 0 to 25 percent cobbles and stones and 40 to 70 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2, A-4, A-6
49 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 3.4 to 5.6 inches
Water supplying capacity: 12 to 14 inches
Runoff: Very rapid
Hydrologic group: B

Erosion factors (upper layer): K value—0.17; T value—3; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Highams Variant Soil

Positions on landscape: South-facing crests and upper side slopes of mountains
Parent material: Kind—residuum; source—limestone, calcareous shale
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush, snowberry, locoweed, Sandberg bluegrass, western wheatgrass
Typical profile:
0 to 7 inches—very gravelly loam; 10 to 25 percent cobbles and stones and 45 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-2
7 to 15 inches—extremely gravelly very fine sandy loam; 25 to 30 percent cobbles and stones and 65 to 85 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, GP-GM; estimated AASHTO classification - A-1
15 to 43 inches—weathered bedrock
43 inches—unweathered bedrock
Range in depth to bedrock: 14 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 0.7 to 1.3 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.17; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—severe
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—concave north-facing side slopes of mountains; contrasting features—thick and dark-colored upper layer, less than 35 percent rock fragments throughout the profile; distinctive present vegetation—antelope bitterbrush, Idaho fescue
Inclusion 2: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren
Inclusion 3: Position on landscape—mainly north-facing windswept crests and upper side slopes of mountains; contrasting features—shallow to hard bedrock, layer of clay accumulation; distinctive present vegetation—big sagebrush, Idaho fescue

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 77)

Elements of Wildlife Habitat

Suitability of Granzan Variant soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Granzan soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Highams Variant soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Granzan Variant Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones, erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Granzan Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones, erodes easily
Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer, large stones

TABLE 77.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Granzan Variant	Granzan	Highams Variant	1	2	3
Bluebunch wheatgrass	AGSP	10-20	30-50	2-5	15-30	2-5	---
Idaho fescue	FEID	1-2	2-5	10-30	15-40	10-30	---
Basin wildrye	ELCI2	1-5	5-10	---	5-10	---	---
Pine bluegrass	POSC	5-10	---	---	---	---	---
Thurber needlegrass	STTH2	10-15	2-10	---	T-10	---	---
Indian ricegrass	ORHY	2-5	---	---	---	---	---
Nevada bluegrass	PONE3	---	2-5	---	2-5	---	---
Webber ricegrass	ORWE	---	---	5-10	---	5-10	---
Cusick bluegrass	POCU3	---	---	5-10	---	5-10	---
Sandberg bluegrass	POSE	---	---	5-10	---	5-10	---
Other perennial grasses	PPGG	2-4	5-10	2-8	5-10	2-8	---
Lupine	LUPIN	---	2-5	---	---	---	---
Arrowleaf balsamroot	BASA3	---	2-5	---	5-10	---	---
Goldenweed	HAPLO2	---	---	2-5	---	2-5	---
Phlox	PHLOX	---	---	2-5	---	2-5	---
Hawksbeard	CREPI	---	---	2-5	1-5	2-5	---
Other perennial forbs	PPFF	10-20	2-5	5-10	5-15	5-10	---
Curlleaf mtn. mahogany	CELE3	5-10	---	---	---	---	---
Mountain big sagebrush	ARTRV	5-10	5-10	---	10-15	---	---
Snowberry	SYMPH	1-5	---	---	---	---	---
Antelope bitterbrush	PUTR2	---	2-5	---	5-15	---	---
Black sagebrush	ARARN	---	---	5-10	---	5-10	---
Low sagebrush	ARAR8	---	---	5-15	---	5-15	---
Other shrubs	SSSS	5-10	2-10	2-10	5-15	2-10	---
Range site symbol		028B042N	025X009N	025X024N	025X012N	025X024N	BARREN
Potential production (lb/acre):							
Favorable years		900	1,300	350	1,200	350	---
Normal years		600	900	250	900	250	---
Unfavorable years		400	700	150	600	150	---

Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Highams Variant Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, seepage, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—small stones
Gravel: Improbable source—thin layer

Interpretive Groups

Capability classification: VIIs, nonirrigated

Range site symbol: Granzan Variant soil—028B042N; Granzan soil—025X009N; Highams Variant soil—025X024N;

550—Decram-Decram Variant-Duff association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 7,500 to 8,300 feet
Climatic data (average annual):
Precipitation—about 16 inches
Air temperature—about 42 degrees F
Frost-free season—about 60 days

Composition

Decram very gravelly loam, 15 to 50 percent slopes (Typic Cryoborolls - loamy-skeletal, mixed)—50 percent
Decram Variant very cobbly loam, 15 to 30 percent slopes (Argic Cryoborolls - loamy-skeletal, mixed)—20 percent
Duff gravelly loam, 30 to 50 percent slopes (Pachic Cryoborolls - fine-loamy, mixed)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—4 percent
Inclusion 2: Rubble land—3 percent
Inclusion 3: Lithic Xerollic Haplargids, 30 to 50 percent slopes (Lithic Xerollic Haplargids - loamy-skeletal, mixed, frigid)—3 percent

Decram Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—quartzite, chert, volcanic rocks
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Low sagebrush, rabbitbrush, Idaho fescue, Thurber needlegrass
Typical profile:
0 to 10 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 55 to 70 percent pebbles (by weight) structure; granular structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
10 to 39 inches—very gravelly loam, very cobbly loam, extremely gravelly loam; 15 to 55 percent cobbles and stones and 40 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-6
39 inches—unweathered bedrock
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 2.0 to 2.7 inches
Water supplying capacity: 12 to 14 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.10; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Decram Variant Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—andesite
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush, rabbitbrush, Idaho fescue, Thurber needlegrass
Typical profile:
0 to 14 inches—very cobbly loam; 30 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
14 to 26 inches—extremely gravelly clay loam, extremely gravelly sandy clay loam; 10 to 25 percent cobbles and stones and 70 to 80 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
26 inches—unweathered bedrock
Range in depth to bedrock: 20 to 32 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 1.9 to 2.4 inches
Water supplying capacity: 12 to 14 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Duff Soil

Positions on landscape: Side slopes of mountains

Parent material: Kind—residuum, colluvium; source—andesite, rhyolite, quartz latite
Slope features: Length—long; shape—concave
Dominant present vegetation: Big sagebrush, antelope bitterbrush, Douglas rabbitbrush, basin wildrye, bluegrass
Typical profile:
0 to 7 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 6.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-4
7 to 57 inches—gravelly loam, gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC, CL-ML, CL; estimated AASHTO classification - A-4, A-6
57 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 5.7 to 7.4 inches
Water supplying capacity: 13 to 15 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.20; T value—3; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren
Inclusion 2: Position on landscape—occurs as rock stripes in areas immediately below rock outcrops; contrasting feature—more than 90 percent of surface covered with stones; distinctive present vegetation—barren
Inclusion 3: Position on landscape—convex crests and lower side slopes of mountains, near rock outcrops; contrasting feature—bedrock at a depth of less than 20 inches; distinctive present vegetation—low sagebrush, Idaho fescue

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 78)

Elements of Wildlife Habitat

Suitability of Decram soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Decram Variant soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Duff soil for named elements:
Wild herbaceous plants (nonirrigated)—good
Shrubs (nonirrigated)—good

Ratings for Selected Uses

Decram Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Decram Variant Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, large stones
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Duff Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 78.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Decram	Decram Variant	Duff	1	2	3
Idaho fescue	FEID	10-30	10-30	15-40	---	---	10-30
Webber ricegrass	ORWE	5-10	5-10	---	---	---	5-10
Cusick bluegrass	POCU3	5-10	5-10	---	---	---	5-10
Sandberg bluegrass	POSE	5-10	5-10	---	---	---	5-10
Bluebunch wheatgrass	AGSP	2-5	2-5	15-30	---	---	2-5
Basin wildrye	ELCI2	---	---	5-10	---	---	---
Nevada bluegrass	PONE3	---	---	2-5	---	---	---
Thurber needlegrass	STTH2	---	---	T-10	---	---	---
Other perennial grasses	PPGG	2-8	2-8	5-10	---	---	2-8
Goldenweed	HAPLO2	2-5	2-5	---	---	---	2-5
Phlox	PHLOX	2-5	2-5	---	---	---	2-5
Hawksbeard	CREPI	2-5	2-5	1-5	---	---	2-5
Arrowleaf balsamroot	BASA3	---	---	5-10	---	---	---
Other perennial forbs	PPFF	5-10	5-10	5-15	---	---	5-10
Black sagebrush	ARARN	5-10	5-10	---	---	---	5-10
Low sagebrush	ARAR8	5-15	5-15	---	---	---	5-15
Antelope bitterbrush	PUTR2	---	---	5-15	---	---	---
Mountain big sagebrush	ARTRV	---	---	10-15	---	---	---
Other shrubs	SSSS	2-10	2-10	5-15	---	---	2-10
Range site symbol		025X024N	025X024N	025X012N	BARREN	BARREN	025X024N
Potential production (lb/acre):							
Favorable years		350	350	1,200	---	---	350
Normal years		250	250	900	---	---	250
Unfavorable years		150	150	600	---	---	150

Interpretive Groups

Capability classification: Decram soil—VIIs, nonirrigated; Decram Variant soil—VIIs, nonirrigated; Duff soil—VIIe, nonirrigated

Range site symbol: Decram soil—025X024N; Decram Variant soil—025X024N; Duff soil—025X012N

551—Decram-Hapgood association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 7,800 to 9,500 feet
Climatic data (average annual):
Precipitation—about 18 inches
Air temperature—about 42 degrees F
Frost-free season—about 50 days

Composition

Decram very stony loam, 15 to 50 percent slopes (Typic Cryoborolls - loamy-skeletal, mixed)—50 percent
Hapgood very gravelly loam, 15 to 30 percent slopes (Pachic Cryoborolls - loamy-skeletal, mixed)—35 percent
Contrasting inclusions as follows:
Inclusion 1: Argic Pachic Cryoborolls, 8 to 30 percent slopes—6 percent
Inclusion 2: Rock outcrop—6 percent
Inclusion 3: Cumulic Cryaquolls, drained, 2 to 8 percent slopes—2 percent
Inclusion 4: Cumulic Cryaquolls, 2 to 8 percent slopes—1 percent

Decram Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—quartzite, chert, volcanic rocks
Slope features: Length—long; shape—smooth to convex
Dominant present vegetation: Low sagebrush, black sagebrush, bluebunch wheatgrass, Indian ricegrass, Sandberg bluegrass, Idaho fescue, pine bluegrass
Typical profile:
0 to 10 inches—very stony loam; 15 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
10 to 39 inches—very gravelly loam, very cobbly loam, extremely gravelly loam; 15 to 55 percent cobbles and stones and 40 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-6
39 inches—unweathered bedrock
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 1.6 to 2.3 inches
Water supplying capacity: 12 to 14 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.10; T value—2; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Hapgood Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum, colluvium; source—andesite influenced by loess and volcanic ash
Slope features: Length—long; shape—smooth to concave
Dominant present vegetation: Mountain big sagebrush, basin wildrye, Idaho fescue, mountain brome
Typical profile:
0 to 12 inches—very gravelly loam; 50 to 75 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GM; estimated AASHTO classification - A-2
12 to 45 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 10 percent cobbles and stones and 45 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2
45 inches—unweathered bedrock
Range in depth to bedrock: 40 to 48 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 3.6 to 4.5 inches
Water supplying capacity: 16 to 18 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.17; T value—3; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—concave north-facing side slopes of mountains; contrasting features—layer of clay accumulation, receives additional moisture from drifted snow; distinctive present vegetation—common chokecherry, snowberry, serviceberry, Idaho fescue

Inclusion 2: Position on landscape—crests and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Inclusion 3: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, moderately wet; distinctive present vegetation—basin big sagebrush, basin wildrye, rabbitbrush

Inclusion 4: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, wet; distinctive present vegetation—sedge, willow, tufted hairgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 79)

Elements of Wildlife Habitat

Suitability of Decram soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Suitability of Hapgood soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Decram Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones
Roadfill: Poor—depth to rock, large stones, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, large stones, slope
Local roads and streets: Severe—slope, large stones
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Hapgood Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones
Roadfill: Fair—depth to rock, thin layer, slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site symbol: Decram soil—028B038N; Hapgood soil—028B029N

TABLE 79.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Decram	Hapgood	1	2	3	4
Bluebunch wheatgrass	AGSP	5-10	2-5	1-3	---	---	---
Pine bluegrass	POSC	5-10	---	---	---	---	---
Idaho fescue	FEID	10-15	10-15	5-10	---	---	---
Thurber needlegrass	STTH2	2-5	---	---	---	---	---
Bottlebrush squirreltail	SIHY	2-5	---	---	---	---	---
Indian ricegrass	ORHY	2-5	---	---	---	---	---
Letterman needlegrass	STLE4	2-5	5-10	---	---	---	---
Mountain brome	BRMA4	---	15-20	2-5	---	---	---
Columbia needlegrass	STCO3	---	2-5	---	---	---	---
Slender wheatgrass	AGTR	---	1-2	---	---	---	---
Basin wildrye	ELCI2	---	1-2	1-5	---	30-50	---
Spike-fescue	HEKI	---	5-10	---	---	---	---
Western wheatgrass	AGSM	---	---	---	---	5-10	---
Nevada bluegrass	PONE3	---	---	---	---	5-10	5-10
Tufted hairgrass	DECA5	---	---	---	---	---	30-60
Sedge	CAREX	---	---	---	---	---	5-10
Alpine timothy	PHAL2	---	---	---	---	---	5-10
Other perennial grasses	PPGG	10-15	5-10	5-15	---	5-15	2-10
Sierra clover	TRWO	---	---	---	---	---	2-5
Cinquefoil	POTEN	---	---	---	---	---	2-5
Other perennial forbs	PPFF	5-10	5-10	5-15	---	5-10	10-20
Low sagebrush	ARAR8	20-35	---	---	---	---	---
Low rabbitbrush	CHVIH2	2-5	---	---	---	---	---
Snowberry	SYMPH	2-5	5-10	5-10	---	---	---
Horsebrush	TETRA3	2-5	---	---	---	---	---
Mountain big sagebrush	ARTRV	---	10-20	1-5	---	1-2	---
Serviceberry	AMELA	---	5-10	2-5	---	---	---
Common chokecherry	PRVI	---	---	20-30	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	5-10	---
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5	---
Willow	SALIX	---	---	---	---	---	2-5
Other shrubs	SSSS	5-10	5-10	10-15	---	5-10	---

Range site symbol	028B038N	028B029N	028B026N	BARREN	028B024N	025X005N
Potential production (lb/acre):						
Favorable years	800	1,500	1,400	---	2,800	2,000
Normal years	600	900	1,000	---	1,700	1,700
Unfavorable years	400	700	700	---	1,000	1,000

552—Decram-Hapgood-Loncan association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 7,000 to 9,000 feet
Climatic data (average annual):
Precipitation—about 16 inches
Air temperature—about 42 degrees F
Frost-free season—about 65 days

Composition

Decram very stony loam, 8 to 30 percent slopes (Typic Cryoborolls - loamy-skeletal, mixed)—50 percent
Hapgood very gravelly loam, 15 to 30 percent slopes (Pachic Cryoborolls - loamy-skeletal, mixed)—25 percent
Loncan gravelly loam, 30 to 50 percent slopes (Aridic Haploxerolls - loamy-skeletal, mixed, frigid)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—4 percent
Inclusion 2: Labshaft very stony loam, 30 to 50 percent slopes (Lithic Cryoborolls, loamy-skeletal, mixed)—4 percent
Inclusion 3: Cumulic Cryaquolls, drained, 2 to 8 percent slopes—1 percent
Inclusion 4: Cumulic Cryaquolls, 2 to 8 percent slopes—1 percent

Decram Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—volcanic rocks, quartzite, chert
Slope features: Length—long; shape—smooth to convex
Dominant present vegetation: Low sagebrush, black sagebrush, Indian ricegrass, bluebunch wheatgrass, bluegrass
Typical profile:
0 to 10 inches—very stony loam; 15 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
10 to 39 inches—very gravelly loam, very cobbly loam, extremely gravelly loam; 15 to 55 percent cobbles and stones and 40 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-6
39 inches—unweathered bedrock
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 1.6 to 2.3 inches
Water supplying capacity: 12 to 14 inches
Runoff: Medium
Erosion factors (upper layer): K value—0.10; T value—2; wind erodibility group—8
Hydrologic group: C
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Hapgood Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum, colluvium; source—andesite influenced by loess and volcanic ash
Slope features: Length—long; shape—concave
Dominant present vegetation: Mountain big sagebrush, basin wildrye, Idaho fescue, mountain brome
Typical profile:
0 to 12 inches—very gravelly loam; 50 to 75 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GM; estimated AASHTO classification - A-2
12 to 45 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 10 percent cobbles and stones and 45 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2
45 inches—unweathered bedrock
Range in depth to bedrock: 40 to 48 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 3.6 to 4.5 inches
Water supplying capacity: 16 to 18 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.17; T value—3; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low

Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Loncan Soil

Positions on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum, colluvium; source—sedimentary and volcanic rocks
Slope features: Length—long; shape—smooth to concave
Dominant present vegetation: Big sagebrush, bluebunch wheatgrass, basin wildrye
Typical profile:
0 to 10 inches—gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, CL; estimated AASHTO classification - A-6
10 to 35 inches—very gravelly loam, extremely cobbly loam, very gravelly sandy clay loam; 10 to 45 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
35 inches—unweathered bedrock
Range in depth to bedrock: 21 to 38 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 2.2 to 4.0 inches
Water supplying capacity: 12 to 14 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.17; T value—2; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren
Inclusion 2: Position on landscape—convex side slopes of mountains near rock outcrops; contrasting feature—shallow to hard bedrock; distinctive present vegetation—curlleaf mountainmahogany, mountain big sagebrush
Inclusion 3: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, moderately wet; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 4: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, wet; distinctive present vegetation—sedge, willow, tufted hairgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 80)

TABLE 80.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Decram	Hapgood	Loncan	1	2	3	4
Bluebunch wheatgrass	AGSP	5-10	2-5	10-20	---	5-10	---	---
Pine bluegrass	POSC	5-10	---	2-5	---	2-5	---	---
Idaho fescue	FEID	10-15	10-15	2-5	---	5-15	---	---
Thurber needlegrass	STTH2	2-5	---	5-10	---	2-5	---	---
Bottlebrush squirreltail	SIHY	2-5	---	---	---	---	---	---
Indian ricegrass	ORHY	2-5	---	---	---	---	---	---
Letterman needlegrass	STLE4	2-5	5-10	---	---	2-5	---	---
Mountain brome	BRMA4	---	15-2	---	---	---	---	---
Columbia needlegrass	STCO3	---	2-5	---	---	5-10	---	---
Slender wheatgrass	AGTR	---	1-2	---	---	---	---	---
Basin wildrye	ELCI2	---	1-2	2-5	---	---	30-50	---
Spike-fescue	HEKI	---	5-10	---	---	---	---	---
Western wheatgrass	AGSM	---	---	1-5	---	---	5-10	---
Western needlegrass	STOC2	---	---	---	---	5-10	---	---
Nevada bluegrass	PONE3	---	---	---	---	---	5-10	5-10
Tufted hairgrass	DECA5	---	---	---	---	---	---	30-60
Sedge	CAREX	---	---	---	---	---	---	5-10
Alpine timothy	PHAL2	---	---	---	---	---	---	5-10
Other perennial grasses	PPGG	10-15	5-10	10-20	---	5-10	5-15	2-10
Sierra clover	TRWO	---	---	---	---	---	---	2-5
Cinquefoil	POTEN	---	---	---	---	---	---	2-5
Other perennial forbs	PPFF	5-10	5-10	5-12	---	10-15	5-10	10-20
Low sagebrush	ARAR8	20-35	---	---	---	---	---	---
Low rabbitbrush	CHVIH2	2-5	---	---	---	---	---	---
Snowberry	SYMPH	2-5	5-10	---	---	1-5	---	---
Horsebrush	TETRA3	2-5	---	1-2	---	---	---	---
Mountain big sagebrush	ARTRV	---	10-20	15-25	---	5-10	1-2	---
Serviceberry	AMELA	---	5-10	2-10	---	---	---	---
Antelope bitterbrush	PUTR2	---	---	5-10	---	---	---	---
Mountainmahogany	CERCO	---	---	---	---	5-10	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	---	5-10	---
Rubber rabbitbrush	CHNA2	---	---	---	---	---	2-5	---
Willow	SALIX	---	---	---	---	---	---	2-5
Other shrubs	SSSS	5-10	5-10	5-15	---	5-10	5-10	---

Range site symbol	028B038N	028B029N	028B030N	BARREN	028B043N	028B024N	025X005N
Potential production (lb/acre):							
Favorable years	800	1,500	1,100	---	1,000	2,800	2,000
Normal years	600	900	800	---	800	1,700	1,700
Unfavorable years	400	700	600	---	600	1,000	1,000

Elements of Wildlife Habitat

Suitability of Decram soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Hapgood soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Loncan soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Decram Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones
Roadfill: Poor—depth to rock, large stones
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, large stones, slope
Local roads and streets: Severe—slope, large stones
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Hapgood Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones
Roadfill: Fair—depth to rock, thin layer, slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Loncan Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty, erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Decram soil—VIIs, nonirrigated; Hapgood soil—VIIs, nonirrigated; Loncan soil—VIIe, nonirrigated
Range site symbol: Decram soil—028B038N; Hapgood soil—028B029N; Loncan soil—028B030N

553—Decram-Winu-Chad association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 7,000 to 9,000 feet
Climatic data (average annual):
Precipitation—about 16 inches
Air temperature—about 43 degrees F
Frost-free season—about 50 days

Composition

Decram very stony loam, 15 to 30 percent slopes (Typic Cryoborolls - loamy-skeletal, mixed)—40 percent
Winu gravelly loam, 15 to 30 percent slopes (Argic Pachic Cryoborolls - fine-loamy, mixed)—30 percent
Chad cobbly loam, 30 to 50 percent slopes (Aridic Argixerollis - fine, mixed, frigid)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Argic Pachic Cryoborolls, 8 to 30 percent slopes—7 percent
Inclusion 2: Rock outcrop—4 percent
Inclusion 3: Cumulic Cryaquolls, drained, 2 to 8 percent slopes—3 percent
Inclusion 4: Cumulic Cryaquolls, 2 to 8 percent slopes—1 percent

Decram Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—volcanic rocks, quartzite, chert
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, black sagebrush, bluebunch wheatgrass, Indian ricegrass, Sandberg bluegrass
Typical profile:
0 to 10 inches—very stony loam; 15 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
10 to 39 inches—very gravelly loam, very cobbly loam, extremely gravelly loam; 15 to 55 percent cobbles and stones and 40 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-6
39 inches—unweathered bedrock
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 1.6 to 2.3 inches
Water supplying capacity: 12 to 14 inches
Runoff: Rapid
Erosion factors (upper layer): K value—0.10; T value—2; wind erodibility group—8
Hydrologic group: C
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Winu Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum, colluvium; source—volcanic rock
Slope features: Length—long; shape—concave
Dominant present vegetation: Mountain big sagebrush, mountain brome, bluebunch wheatgrass, Idaho fescue, snowberry
Typical profile:
0 to 8 inches—gravelly loam; 25 to 50 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, CL-ML; estimated AASHTO classification - A-2, A-4
8 to 32 inches—gravelly loam, gravelly sandy clay loam, gravelly clay loam; 5 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, SC; estimated AASHTO classification - A-6
32 inches—unweathered bedrock
Range in depth to bedrock: 24 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 3.4 to 4.3 inches
Water supplying capacity: 15 to 16 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.20; T value—3; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—moderate

Potential frost action: Moderate

Chad Soil

Positions on landscape: Middle and lower south-facing side slopes of mountains
Parent material: Kind—residuum; source—shale and chert influenced by loess and volcanic ash
Slope features: Length—long; shape—convex
Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, serviceberry
Typical profile:
0 to 17 inches—cobbly loam; 15 to 25 percent cobbles and stones and 25 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
17 to 42 inches—gravelly clay, gravelly clay loam, clay, clay loam; 0 to 5 percent cobbles and stones and 15 to 45 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, MH, SM, SC; estimated AASHTO classification - A-7
42 inches—weathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 4.7 to 5.9 inches
Water supplying capacity: 13 to 15 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.28; T value—3; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—low; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—concave north-facing upper side slopes of mountains; contrasting features—deep, receives additional moisture from drifted snow; distinctive present vegetation—common chokecherry, snowberry, serviceberry, Idaho fescue
Inclusion 2: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren
Inclusion 3: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, moderately wet; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 4: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, wet; distinctive present vegetation—sedge, willow, tufted hairgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 81)

Elements of Wildlife Habitat

Suitability of Decram soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Winu soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Chad soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Decram Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones
Roadfill: Poor—depth to rock, large stones
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, large stones, slope
Local roads and streets: Severe—slope, large stones
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Winu Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 81.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Decram	Winu	Chad	1	2	3	4
Bluebunch wheatgrass	AGSP	5-10	2-5	10-15	1-3	---	---	---
Pine bluegrass	POSC	5-10	---	---	---	---	---	---
Idaho fescue	FEID	10-15	10-15	---	5-10	---	---	---
Thurber needlegrass	STTH2	2-5	---	5-10	---	---	---	---
Bottlebrush squirreltail	SIHY	2-5	---	---	---	---	---	---
Indian ricegrass	ORHY	2-5	---	---	---	---	---	---
Letterman needlegrass	STLE4	2-5	5-10	---	---	---	---	---
Mountain brome	BRMA4	---	15-20	---	2-5	---	---	---
Columbia needlegrass	STCO3	---	2-5	---	---	---	---	---
Slender wheatgrass	AGTR	---	1-2	---	---	---	---	---
Basin wildrye	ELCI2	---	1-2	5-10	1-5	---	30-50	---
Spike-fescue	HEKI	---	5-10	---	---	---	---	---
Western wheatgrass	AGSM	---	---	1-4	---	---	5-10	---
Sandberg bluegrass	POSE	---	---	2-5	---	---	---	---
Nevada bluegrass	PONE3	---	---	---	---	---	5-10	5-10
Tufted hairgrass	DECA5	---	---	---	---	---	---	30-60
Sedge	CAREX	---	---	---	---	---	---	5-10
Alpine timothy	PHAL2	---	---	---	---	---	---	5-10
Other perennial grasses	PPGG	10-15	5-10	10-15	5-15	---	5-15	2-10
Sierra clover	TRWO	---	---	---	---	---	---	2-5
Cinquefoil	POTEN	---	---	---	---	---	---	2-5
Other perennial forbs	PPFF	5-10	5-10	5-15	5-15	---	5-10	10-20
Low sagebrush	ARAR8	20-35	---	---	---	---	---	---
Low rabbitbrush	CHVIH2	2-5	---	---	---	---	---	---
Snowberry	SYMPH	2-5	5-10	---	5-10	---	---	---
Horsebrush	TETRA3	2-5	---	---	---	---	---	---
Mountain big sagebrush	ARTRV	---	10-20	15-25	1-5	---	1-2	---
Serviceberry	AMELA	---	5-10	3-10	2-5	---	---	---
Antelope bitterbrush	PUTR2	---	---	2- 8	---	---	---	---
Common chokecherry	PRVI	---	---	---	20-30	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	---	5-10	---
Rubber rabbitbrush	CHNA2	---	---	---	---	---	2-5	---
Willow	SALIX	---	---	---	---	---	---	2-5
Other shrubs	SSSS	5-10	5-10	15-20	10-15	---	5-10	---

Range site symbol	028B038N	028B029N	028B027N	028B026N	BARREN	028B024N	025X005N
Potential production (lb/acre):							
Favorable years	800	1,500	900	1,400	---	2,800	2,000
Normal years	600	900	600	1,000	---	1,700	1,700
Unfavorable years	400	700	300	700	---	1,000	1,000

Chad Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—slope, shrink-swell
Daily cover for landfill: Poor—too clayey, hard to pack, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—piping, hard to pack
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Decram soil—VIIs, nonirrigated; Winu soil—VIe, nonirrigated; Chad soil—VIIe, nonirrigated
Range site symbol: Decram soil—028B038N; Winu soil—028B029N; Chad soil—028B027N

561—Cherry Spring-Tomera association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 4,800 to 5,700 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Cherry Spring loam, 2 to 8 percent slopes (Haploxerollic Durargids - fine-loamy, mixed, mesic)—45 percent
Tomera loam, 2 to 8 percent slopes (Xerollic Natrargids - fine, montmorillonitic, mesic)—45 percent
Contrasting inclusions as follows:
Inclusion 1: Durixerollic Camborthids, 8 to 15 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, mesic)—4 percent
Inclusion 2: Xerollic Camborthids, 2 to 8 percent slopes (Xerollic Camborthids - sandy-skeletal, mixed, mesic)—3 percent
Inclusion 3: Durixerollic Camborthids, 0 to 2 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, mesic)—3 percent

Cherry Spring Soil

Positions on landscape: Slightly dissected lower part of fan piedmont remnants
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, Sandberg bluegrass, cheatgrass
Typical profile:
0 to 5 inches—loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4
5 to 20 inches—loam, silty clay, clay loam; 0 to 5 percent cobbles and stones and 5 to 20 percent pebbles (by weight); angular blocky structure; hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, ML; estimated AASHTO classification - A-4, A-6
20 to 26 inches—cemented hardpan
26 to 63 inches or more—stratified sandy loam to extremely gravelly sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-1
Range in depth to hardpan: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderately slow
Available water capacity: 3.3 to 3.8 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.43; T value—2; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Tomera Soil

Positions on landscape: Dissected upper part of fan piedmont remnants
Parent material: Kind—alluvium; source—mixed sedimentary rocks, pyroclastic material
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, Sandberg bluegrass, cheatgrass
Typical profile:
0 to 10 inches—loam; 5 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification - ML, CL-ML; estimated AASHTO classification - A-4
10 to 32 inches—clay, gravelly clay; 20 to 45 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CH; estimated AASHTO classification - A-7
32 to 60 inches or more—very gravelly loamy sand, extremely gravelly sandy loam, very cobbly loam; 1 to 40 percent cobbles and stones and 55 to 70 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.8); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow

Available water capacity: 5.9 to 7.3 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: D
Erosion factors (upper layer): K value—0.37; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth to convex fan aprons on upper part of fan piedmonts; contrasting features—slopes of 8 to 15 percent, sandy loam throughout the profile, does not have a layer of clay accumulation; distinctive present vegetation—Wyoming big sagebrush, Sandberg bluegrass, cheatgrass
Inclusion 2: Position on landscape—inset fans dissecting the fan piedmonts; contrasting features—very gravelly loamy sand throughout the profile, does not have a layer of clay accumulation; distinctive present vegetation—Wyoming big sagebrush, Sandberg bluegrass, cheatgrass
Inclusion 3: Position on landscape—smooth fan skirts adjacent to lower part of fan piedmonts; contrasting features—slopes of less than 2 percent, sandy loam throughout the profile, does not have a layer of clay accumulation; distinctive present vegetation—Wyoming big sabebrush, Sandberg bluegrass, cheatgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 82)

Elements of Wildlife Habitat

Suitability of Cherry Spring soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

TABLE 82.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Cherry Spring	Tomera	1	2	3
Bluebunch wheatgrass	AGSP	10-40	10-40	10-40	10-40	10-40
Thurber needlegrass	STTH2	10-40	10-40	10-40	10-40	10-40
Basin wildrye	ELCI2	5-15	5-15	5-15	5-15	5-15
Indian ricegrass	ORHY	2-10	2-10	2-10	2-10	2-10
Webber ricegrass	ORWE	2-10	2-10	2-10	2-10	2-10
Bluegrass	POA++	2-10	2-10	2-10	2-10	2-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10
Perennial forbs	PPFF	5-10	5-10	5-10	5-10	5-10
Big sagebrush	ARTR2	10-15	10-15	10-15	10-15	10-15
Other shrubs	SSSS	5-15	5-15	5-15	5-15	5-15
Range site symbol		025X019N	025X019N	025X019N	025X019N	025X019N
Potential production (lb/acre):						
Favorable years		800	800	800	800	800
Normal years		600	600	600	600	600
Unfavorable years		400	400	400	400	400

Suitability of Tomera soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Cherry Spring Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Moderate—cemented pan, low strength, frost action
Pond reservoir areas: Moderate—cemented pan, slope, seepage
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Tomera Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess sodium
Roadfill: Good
Daily cover for landfill: Poor—hard to pack
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—excess sodium
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Cherry Spring soil—IIIe, irrigated, and VIIs, nonirrigated; Tomera soil—IIIe, irrigated, and VIs, nonirrigated
Range site symbol: 025X019N

565—Cherry Spring Variant-Tomera-Bregar association

Map Unit Setting

Positions on landscape: Low hills, fan piedmont remnants
Elevation: 5,500 to 6,400 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 47 degrees F
Frost-free season—about 100 days

Composition

Cherry Spring Variant fine sandy loam, 8 to 15 percent slopes (Xerollic Durargids - loamy, mixed, mesic, shallow)—40 percent
Tomera loam, 2 to 8 percent slopes (Xerollic Natrargids - fine, montmorillonitic, mesic)—30 percent
Bregar very cobbly loam, 15 to 30 percent slopes (Lithic Xerollic Haplargids - loamy-skeletal, mixed, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Bregar very cobbly loam, 30 to 50 percent slopes (Lithic Xerollic Haplargids - loamy-skeletal, mixed, frigid)—3 percent
Inclusion 2: Xerollic Camborthids, 2 to 8 percent slopes (Xerollic Camborthids - sandy-skeletal, mixed, mesic)—3 percent
Inclusion 3: Durixerollic Camborthids, 2 to 8 percent slopes (Durixerollic Camborthids - fine-loamy, mixed, mesic)—3 percent
Inclusion 4: Rock outcrop—1 percent

Cherry Spring Variant Soil

Positions on landscape: Middle and lower side slopes of low hills
Parent material: Kind—alluvium; source—rhyolite, tuff, basalt
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Black sagebrush, phlox, mustard, Thurber needlegrass, Sandberg bluegrass
Typical profile:
0 to 4 inches—fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-4
4 to 18 inches—gravelly clay loam, gravelly loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, SC; estimated AASHTO classification - A-2, A-6
18 to 28 inches—indurated hardpan
28 to 45 inches or more—strongly silica-cemented hardpan
Range in depth to hardpan: 14 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderately slow
Available water capacity: 1.9 to 2.5 inches
Water supplying capacity: 7 to 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—1; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Tomera Soil

Positions on landscape: Fan-piedmont remnants intermingled with low hills
Parent material: Kind—alluvium; source—mixed sedimentary rocks, pyroclastic material
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Cheatgrass, Indian ricegrass, big sagebrush, Sandberg bluegrass
Typical profile:
0 to 10 inches—loam; 5 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification - ML, CL-ML; estimated AASHTO classification - A-4
10 to 32 inches—clay, gravelly clay; 20 to 45 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CH; estimated AASHTO classification - A-7
32 to 60 inches or more—very gravelly loamy sand, extremely gravelly sandy loam, very cobbly loam; 1 to 40 percent cobbles and stones and 55 to 70 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.8); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None

Permeability: Slow
Available water capacity: 5.9 to 7.3 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: D
Erosion factors (upper layer): K value—0.37; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Moderate

Bregar Soil

Positions on landscape: Crests and upper side slopes of low hills
Parent material: Kind—residuum; source—quartzite, andesite
Slope features: Length—short; shape—convex
Dominant present vegetation: Black sagebrush, downy rabbitbrush, phlox, balsamroot, Thurber needlegrass
Typical profile:
0 to 6 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 55 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC, CL, CL-ML; estimated AASHTO classification - A-2, A-4, A-6
6 to 11 inches—very gravelly clay loam, extremely gravelly loam, extremely cobbly sandy clay loam; 0 to 40 percent cobbles and stones and 50 to 80 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
11 inches—unweathered bedrock
Range in depth to bedrock: 8 to 12 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 1.1 to 1.5 inches
Water supplying capacity: 8 to 9 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.10; T value—1; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—crests and upper side slopes of low hills; contrasting feature—slopes of 30 to 50 percent; distinctive present vegetation—black sagebrush, downy rabbitbrush, phlox, balsamroot, Thurber needlegrass
Inclusion 2: Position on landscape—inset fans adjacent to channels; contrasting features—sandy throughout the profile, does not have a hardpan, does not have a layer of clay accumulation; distinctive present vegetation—cheatgrass, Indian ricegrass, big sagebrush, Sandberg bluegrass
Inclusion 3: Position on landscape—margins of inset fans; contrasting features—does not have a hardpan or a layer of clay accumulation; distinctive present vegetation—cheatgrass, Indian ricegrass, big sagebrush, Sandberg bluegrass
Inclusion 4: Position on landscape—crests of low hills; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 83)

Elements of Wildlife Habitat

Suitability of Cherry Spring Variant soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Tomera soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Bregar soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Cherry Spring Variant Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Severe—cemented pan
Pond reservoir areas: Severe—cemented pan, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Tomera Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess sodium
Roadfill: Good
Daily cover for landfill: Poor—hard to pack

TABLE 83.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Cherry Spring Variant	Tomera	Bregar	1	2	3	4
Indian ricegrass	ORHY	10-15	2-10	---	---	2-10	2-10	---
Thurber needlegrass	STTH2	10-15	10-40	15-20	15-20	10-40	10-40	---
Bluebunch wheatgrass	AGSP	2-5	10-40	15-20	15-20	10-40	10-40	---
Bottlebrush squirreltail	SIHY	2-5	---	3-7	3-7	---	---	---
Sandberg bluegrass	POSE	2-5	---	2-5	2-5	---	---	---
Pine bluegrass	POSC	2-5	---	2-5	2-5	---	---	---
Basin wildrye	ELCI2	---	5-15	---	---	5-15	5-15	---
Webber ricegrass	ORWE	---	2-10	5-15	5-15	2-10	2-10	---
Bluegrass	POA++	---	2-10	---	---	2-10	2-10	---
Other perennial grasses	PPGG	2-5	5-10	---	---	5-10	5-10	---
Perennial forbs	PPFF	5-10	5-10	2-10	2-10	5-10	5-10	---
Black sagebrush	ARARN	25-35	---	---	---	---	---	---
Big sagebrush	ARTR2	---	10-15	---	---	10-15	10-15	---
Low sagebrush	ARAR8	---	---	15-25	15-25	---	---	---
Other shrubs	SSSS	5-35	5-15	2-5	2-5	5-15	5-15	---
Range site symbol		024X030N	025X019N	025X022N	025X022N	025X019N	025X019N	BARREN
Potential production (lb/acre):								
Favorable years		500	800	500	500	800	800	---
Normal years		350	600	375	375	600	600	---
Unfavorable years		250	400	250	250	400	400	---

Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—excess sodium
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Bregar Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, large stones
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Cherry Spring Variant soil—VIIs, nonirrigated; Tomera soil—IIIe, irrigated, and VIs, nonirrigated; Bregar soil—VIIs, nonirrigated
Range site symbol: Cherry Spring Variant soil—024X030N; Tomera soil—025X019N; Bregar soil—025X022N

581—Tomera loam, 4 to 8 percent slopes

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 4,800 to 5,700 feet
Climatic data (average annual):
Precipitation—about 8 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Tomera loam, 4 to 8 percent slopes (Xerollic Natrargids - fine, montmorillonitic, mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Camborthids, 4 to 8 percent slopes (Xerollic Camborthids - sandy-skeletal, mixed, mesic)—5 percent
Inclusion 2: Durixerollic Camborthids, 2 to 4 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, mesic)—5 percent
Inclusion 3: Durixerollic Camborthids, 8 to 15 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, mesic)—5 percent

Tomera Soil

Positions on landscape: Fan-piedmont remnants
Parent material: Kind—alluvium; source—mixed sedimentary rocks, pyroclastic material
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, Sandberg bluegrass, cheatgrass, bottlebrush squirreltail
Typical profile:
0 to 10 inches—loam; 5 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification - ML, CL-ML; estimated AASHTO classification - A-4
10 to 32 inches—clay, gravelly clay; 20 to 45 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CH; estimated AASHTO classification - A-7
32 to 60 inches or more—very gravelly loamy sand, extremely gravelly sandy loam, very cobbly loam; 1 to 40 percent cobbles and stones and 55 to 70 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 5.9 to 7.3 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: D
Erosion factors (upper layer): K value—0.37; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans adjacent to channels; contrasting feature—sandy and very gravelly throughout the profile; distinctive present vegetation—Wyoming big sagebrush, Sandberg bluegrass, cheatgrass, bottlebrush squirreltail
Inclusion 2: Position on landscape—margins of inset fans; contrasting features—sandy loam throughout the profile, does not have a layer of clay accumulation; distinctive present vegetation—Wyoming big sagebrush, Sandberg bluegrass, cheatgrass, bottlebrush squirreltail
Inclusion 3: Position on landscape—dissected side slopes of fan piedmont remnants; contrasting features—slopes of 8 to 15 percent, does not have a layer of clay accumulation; distinctive present vegetation—Wyoming big sagebrush, Sandberg bluegrass, cheatgrass, bottlebrush squirreltail

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 84)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess sodium
Roadfill: Good
Daily cover for landfill: Poor—hard to pack
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Severe—seepage

TABLE 84.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Tomera	1	2	3
Bluebunch wheatgrass	AGSP	10-40	10-40	10-40	10-40
Thurber needlegrass	STTH2	10-40	10-40	10-40	10-40
Basin wildrye	ELCI2	5-15	5-15	5-15	5-15
Indian ricegrass	ORHY	2-10	2-10	2-10	2-10
Webber ricegrass	ORWE	2-10	2-10	2-10	2-10
Bluegrass	POA++	2-10	2-10	2-10	2-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10
Perennial forbs	PPFF	5-10	5-10	5-10	5-10
Big sagebrush	ARTR2	10-15	10-15	10-15	10-15
Other shrubs	SSSS	5-15	5-15	5-15	5-15
Range site symbol		025X019N	025X019N	025X019N	025X019N
Potential production (lb/acre):					
Favorable years		800	800	800	800
Normal years		600	600	600	600
Unfavorable years		400	400	400	400

Embankments, dikes, and levees: Severe—excess sodium
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIIe, irrigated, and VIs, nonirrigated
Range site symbol: 025X019N

590—Hayeston sandy loam, 0 to 4 percent slopes

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 6,000 to 6,600 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 90 days

Composition

Hayeston sandy loam, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Poorcal loam, 0 to 4 percent slopes (Durixerollic Calciorthids - coarse-loamy, mixed, frigid)—6 percent
Inclusion 2: Barrier fine sandy loam, 2 to 8 percent slopes (Haploxerollic Durorthids - loamy, mixed, frigid, shallow)—6 percent
Inclusion 3: Silverado sandy loam, 0 to 4 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, frigid)—3 percent

Hayeston Soil

Positions on landscape: Inset fans
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, basin wildrye, Indian ricegrass
Typical profile:
0 to 4 inches—sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-2, A-4
4 to 27 inches—fine sandy loam, coarse sandy loam, sandy loam; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, SM; estimated AASHTO classification - A-2, A-4
27 to 60 inches or more—stratified very gravelly loamy sand to extremely gravelly sand; 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GP-GM, GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Moderately rapid
Available water capacity: 4.2 to 5.4 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow to slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—remnants of inset fans; contrasting features—layer of lime accumulation, weak silica cementation; distinctive present vegetation—Wyoming big sagebrush, rabbitbrush, basin wildrye, Indian ricegrass
Inclusion 2: Position on landscape—side slopes of adjacent fan piedmont remnants; contrasting feature—shallow to a strongly silica-cemented hardpan; distinctive present vegetation—black sagebrush, small rabbitbrush, Indian ricegrass
Inclusion 3: Position on landscape—smooth fan skirts bordering the margins of the inset fans; contrasting features—noncalcareous upper layer, weak silica cementation in the lower layers; distinctive present vegetation—Wyoming big sagebrush, rabbitbrush, basin wildrye, Indian ricegrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 85)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—flooding, frost action
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

TABLE 85.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Hayeston	1	2	3
Indian ricegrass	ORHY	20-30	20-30	15-25	20-30
Needleandthread	STCO4	10-20	10-20	5-10	10-20
Bottlebrush squirreltail	SIHY	5-10	5-10	---	5-10
Sandberg bluegrass	POSE	2-5	2-5	---	2-5
Bluebunch wheatgrass	AGSP	---	---	2-5	---
Basin wildrye	ELCI2	---	---	2-5	---
Other perennial grasses	PPGG	5-10	5-10	10-20	5-10
Perennial forbs	PPFF	2-5	2-5	5-10	2-5
Wyoming big sagebrush	ARTRW*	15-20	15-20	---	15-20
Black sagebrush	ARARN	---	---	20-30	---
Bud sagebrush	ARSP5	---	---	2-5	---
Winterfat	EULA5	---	---	5-10	---
Small rabbitbrush	CHVIS	---	---	2-5	---
Other shrubs	SSSS	5-10	5-10	10-20	5-10
Range site symbol		028B010N	028B010N	028B011N	028B010N
Potential production (lb/acre):					
Favorable years		800	800	900	800
Normal years		600	600	700	600
Unfavorable years		400	400	400	400

Interpretive Groups

Range site symbol: 028B010N

Capability classification: IIIe, irrigated, and VIIc, nonirrigated

600—Rubyhill sandy loam, 0 to 4 percent slopes

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 6,000 to 7,000 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 90 days

Composition

Rubyhill sandy loam, 0 to 4 percent slopes (Haploxerollic Durorthids - fine-loamy, mixed, frigid)—90 percent
Contrasting inclusions as follows:
Inclusion 1: Hayeston sandy loam, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—8 percent
Inclusion 2: Pedoli loam, 0 to 4 percent slopes (Xerollic Haplargids - fine-loamy, mixed, frigid)—2 percent

Rubyhill Soil

Positions on landscape: Slightly dissected fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth to slightly convex
Dominant present vegetation: Wyoming big sagebrush, Indian ricegrass, rabbitbrush
Typical profile:
0 to 3 inches—sandy loam; 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-2, A-4
3 to 21 inches—loam, clay loam, gravelly loam; 10 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, CL, GC; estimated AASHTO classification - A-6
21 to 60 inches or more—cemented hardpan
Range in depth to hardpan: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 3.2 to 3.8 inches
Water supplying capacity: 7 to 9 inches
Runoff: Slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth to slightly concave inset fans; contrasting features—very deep, does not have a silica-cemented hardpan; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass, rabbitbrush
Inclusion 2: Position on landscape—slightly concave parts of fan piedmont remnants; contrasting features—layer of clay accumulation, does not have a silica-cemented hardpan; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass, rabbitbrush

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 86)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Moderate—cemented pan, frost action
Pond reservoir areas: Moderate—seepage, cemented pan
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IVe, irrigated, and VIIs, nonirrigated
Range site symbol: 028B010N

TABLE 86.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Rubyhill	1	2
Indian ricegrass	ORHY	20-30	20-30	20-30
Needleandthread	STCO4	10-20	10-20	10-20
Bottlebrush squirreltail	SIHY	5-10	5-10	5-10
Sandberg bluegrass	POSE	2-5	2-5	2-5
Other perennial grasses	PPGG	5-10	5-10	5-10
Perennial forbs	PPFF	2-5	2-5	2-5
Wyoming big sagebrush	ARTRW*	15-20	15-20	15-20
Other shrubs	SSSS	5-10	5-10	5-10
Range site symbol		028B010N	028B010N	028B010N
Potential production (lb/acre):				
Favorable years		800	800	800
Normal years		600	600	600
Unfavorable years		400	400	400

601—Rubyhill-Barrier association

Map Unit Setting

Positions on landscape: Lower part of fan piedmonts
Elevation: 6,000 to 7,000 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 90 days

Composition

Rubyhill sandy loam, 0 to 8 percent slopes (Haploxerollic Durorthids - fine-loamy, mixed, frigid)—60 percent
Barrier fine sandy loam, 2 to 8 percent slopes (Haploxerollic Durorthids - loamy, mixed, frigid, shallow)—25 percent
Contrasting inclusions as follows:
Inclusion 1: Hayeston sandy loam, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—10 percent
Inclusion 2: Barrier sandy loam, eroded, 8 to 30 percent slopes (Haploxerollic Durorthids - loamy, mixed, frigid, shallow)—5 percent

Rubyhill Soil

Positions on landscape: Summits of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, Indian ricegrass, rabbitbrush
Typical profile:
0 to 3 inches—sandy loam; 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-2, A-4
3 to 21 inches—loam, clay loam, gravelly loam; 10 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, CL, GC; estimated AASHTO classification - A-6
21 to 60 inches or more—cemented hardpan
Range in depth to hardpan: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 3.2 to 3.8 inches
Water supplying capacity: 7 to 9 inches
Runoff: Slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Barrier Soil

Positions on landscape: Shoulders and side slopes of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—short; shape—convex
Dominant present vegetation: Black sagebrush, spiny horsebrush, rabbitbrush, Indian ricegrass
Typical profile:
0 to 5 inches—fine sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
5 to 15 inches—fine sandy loam, loam, gravelly sandy loam; 15 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - SM, GM; estimated AASHTO classification - A-2, A-4
15 to 45 inches or more—cemented hardpan
Range in depth to hardpan: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 1.5 to 2.0 inches
Water supplying capacity: 8 to 9 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.28; T value—1; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans; contrasting features—very deep, does not have a silica-cemented hardpan; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass, rabbitbrush
Inclusion 2: Position on landscape—eroded side slopes of fan piedmont remnants; contrasting features—slopes of 8 to 30 percent, thin upper layer;

distinctive present vegetation—black sagebrush, Indian ricegrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 87)

Elements of Wildlife Habitat

Suitability of Rubyhill soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor
Suitability of Barrier soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Rubyhill Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Moderate—cemented pan, frost action
Pond reservoir areas: Moderate—seepage, cemented pan, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 87.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Rubyhill	Barrier	1	2
Indian ricegrass	ORHY	20-30	15-25	20-30	10-30
Needleandthread	STCO4	10-20	5-10	10-20	---
Bottlebrush squirreltail	SIHY	5-10	---	5-10	5-10
Sandberg bluegrass	POSE	2-5	---	2-5	---
Bluebunch wheatgrass	AGSP	---	2-5	---	---
Basin wildrye	ELCI2	---	2-5	---	---
Other perennial grasses	PPGG	5-10	10-20	5-10	10-20
Perennial forbs	PPFF	2-5	5-10	2-5	---
Wyoming big sagebrush	ARTRW*	15-20	---	15-20	10-25
Black sagebrush	ARARN	---	20-30	---	5-15
Bud sagebrush	ARSP5	---	2-5	---	---
Winterfat	EULA5	---	5-10	---	---
Small rabbitbrush	CHVIS	---	2-5	---	---
Other shrubs	SSSS	5-10	10-20	5-10	2-5
Range site symbol		028B010N	028B011N	028B010N	025X025N
Potential production (lb/acre):					
Favorable years		800	900	800	200
Normal years		600	700	600	150
Unfavorable years		400	400	400	100

Barrier Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Moderate—cemented pan, frost action
Pond reservoir areas: Severe—cemented pan
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Rubyhill soil—IVe, irrigated, and VIIs, nonirrigated; Barrier soil—VIIs, nonirrigated
Range site symbol: Rubyhill soil—028B010N; Barrier soil—028B011N

610—Needle Peak silt loam, occasionally flooded

Map Unit Setting

Positions on landscape: Flood plains
Elevation: 4,700 to 4,800 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Needle Peak silt loam, occasionally flooded, 0 to 2 percent slopes (Aquic Torriorthents - fine-silty, mixed (calcareous), mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Aeric Fluvaquents, 0 to 2 percent slopes (Aeric Fluvaquents - fine-silty, mixed (calcareous), mesic)—5 percent
Inclusion 2: Aquic Torriorthents, rarely flooded, 0 to 2 percent slopes—5 percent
Inclusion 3: Aeric Halaquepts, strongly alkali, 0 to 2 percent slopes—5 percent

Needle Peak Soil

Positions on landscape: Flood plains
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Basin big sagebrush, rubber rabbitbrush, basin wildrye, inland saltgrass
Typical profile:
0 to 4 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, ML; estimated AASHTO classification - A-6
4 to 60 inches or more—silt loam; silty clay loam; subangular blocky structure; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, ML; estimated AASHTO classification - A-6, A-7
Depth to seasonal high water table: 48 to 60 inches
Hazard of flooding: Frequency—occasional; duration—brief; months—January through May
Permeability: Moderately slow
Available water capacity: 11.4 to 12.6 inches
Water supplying capacity: 6 to 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—flood plains adjacent to channels; contrasting feature—poorly drained; distinctive present vegetation—black greasewood, basin wildrye, inland saltgrass
Inclusion 2: Position on landscape—stream terraces; contrasting feature—rarely flooded; distinctive present vegetation—spiny horsebrush, bud sagebrush
Inclusion 3: Position on landscape—alluvial flats bordering flood plains; contrasting feature—strongly sodium- and salt-affected; distinctive present vegetation—black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 88)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—fair
Shallow water areas—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Poor—low strength
Daily cover for landfill: Fair—too clayey
Shallow excavations: Moderate—wetness, flooding
Local roads and streets: Severe—low strength, flooding, frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Moderate—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIw, irrigated, and VIw, nonirrigated
Range site symbol: 024X006N

TABLE 88.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Needle Peak	1	2	3
Basin wildrye	ELCI2	50-60	40-60	T-2	5-15
Inland saltgrass	DIST	2-5	5-10	T-2	5-10
Bottlebrush squirreltail	SIHY	2-5	---	7-10	---
Western wheatgrass	AGSM	5-10	---	---	---
Mat muhly	MURI	2-5	---	---	---
Alkali sacaton	SPAI	---	15-30	---	---
Other perennial grasses	PPGG	2-5	2-4	---	T-4
Povertyweed	IVAX	1-2	1-2	---	---
Miterwort	NITRO	---	---	2-3	---
Other perennial forbs	PPFF	2-3	2-4	T-3	T-4
Black greasewood	SAVE4	2-5	5-15	20-30	60-75
Rubber rabbitbrush	CHNA2	2-5	2-5	---	---
Basin big sagebrush	ARTRT*	15-20	---	---	---
Shadscale	ATCO	---	---	30-40	---
Bud sagebrush	ARSP5	---	---	5-10	---
Seepweed	SUAED	---	---	5-15	---
Other shrubs	SSSS	2-4	2-5	---	5-10
Range site symbol		024X006N	024X007N	024X003N	024X011N
Potential production (lb/acre):					
Favorable years		1,500	1,900	600	500
Normal years		1,100	1,400	450	350
Unfavorable years		600	800	300	200

620—Silverado sandy loam, 2 to 8 percent slopes

Map Unit Setting

Positions on landscape: Fan skirts
Elevation: 6,000 to 6,800 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 43 degrees F
Frost-free season—about 90 days

Composition

Silverado sandy loam, 2 to 8 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, frigid)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Hayeston sandy loam, 2 to 8 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—7 percent
Inclusion 2: Barrier sandy loam, 8 to 15 percent slopes (Haploxerollic Durorthids - loamy, mixed, frigid, shallow)—6 percent
Inclusion 3: Barrier fine sandy loam, 8 to 15 percent slopes (Haploxerollic Durorthids - loamy, mixed, frigid, shallow)—2 percent

Silverado Soil

Positions on landscape: Fan skirts
Parent material: Mixed alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, Douglas rabbitbrush, Indian ricegrass
Typical profile:
0 to 6 inches—sandy loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; neutral (pH 7.1); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
6 to 14 inches—sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
14 to 35 inches—gravelly sandy loam, sandy loam; 15 to 45 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, SM; estimated AASHTO classification - A-1
35 to 60 inches or more—very gravelly coarse sand; 55 to 65 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GP; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 35 inches—moderately rapid; below this depth—very rapid
Available water capacity: 4.2 to 5.5 inches
Water supplying capacity: 7 to 9 inches
Runoff: Slow to medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.32; T value—3; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans on the fan skirts; contrasting feature—does not have a layer of weak silica cementation; distinctive present vegetation—Wyoming big sagebrush, Douglas rabbitbrush, Indian ricegrass
Inclusion 2: Position on landscape—strongly dissected areas of adjacent fan piedmonts; contrasting features—shallow to a silica-cemented hardpan, slopes of 8 to 15 percent; distinctive present vegetation—big sagebrush, black sagebrush, small rabbitbrush
Inclusion 3: Position on landscape—dissected upper side slopes of adjacent fan piedmonts; contrasting features—shallow to a silica-cemented hardpan, slopes of 8 to 15 percent; distinctive present vegetation—black sagebrush, small rabbitbrush, Indian ricegrass

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 89)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:

TABLE 89.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Silverado	1	2	3
Indian ricegrass	ORHY	20-30	20-30	15-25	10-30
Needleandthread	STCO4	10-20	10-20	5-10	---
Bottlebrush squirreltail	SIHY	5-10	5-10	---	5-10
Sandberg bluegrass	POSE	2-5	2-5	---	---
Bluebunch wheatgrass	AGSP	---	---	2-5	---
Basin wildrye	ELCI2	---	---	2-5	---
Other perennial grasses	PPGG	5-10	5-10	10-20	10-20
Perennial forbs	PPFF	2-5	2-5	5-10	---
Wyoming big sagebrush	ARTRW*	15-20	15-20	---	10-25
Black sagebrush	ARARN	---	---	20-30	5-15
Bud sagebrush	ARSP5	---	---	2-5	---
Winterfat	EULA5	---	---	5-10	---
Small rabbitbrush	CHVIS	---	---	2-5	---
Other shrubs	SSSS	5-10	5-10	10-20	2-5
Range site symbol		028B010N	028B010N	028B011N	025X025N
Potential production (lb/acre):					
Favorable years		800	800	900	200
Normal years		600	600	700	150
Unfavorable years		400	400	400	100

Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones, too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: IVe, irrigated, and VIIc, nonirrigated
Range site symbol: 028B010N

621—Silverado sandy loam, 0 to 2 percent slopes

Map Unit Setting

Positions on landscape: Fan skirts
Elevation: 6,000 to 6,800 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 43 degrees F
Frost-free season—about 90 days

Composition

Silverado sandy loam, 0 to 2 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, frigid)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Hayeston sandy loam, 0 to 2 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—6 percent
Inclusion 2: Pedoli loam, 0 to 2 percent slopes (Xerollic Haplargids - fine-loamy, mixed, frigid)—5 percent
Inclusion 3: Bubus loam, 0 to 2 percent slopes (Durorthidic Torriorthents - coarse-loamy, mixed (calcareous), mesic)—4 percent

Silverado Soil

Positions on landscape: Fan skirts
Parent material: Mixed alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth to slightly convex
Dominant present vegetation: Wyoming big sagebrush, Douglas rabbitbrush, Indian ricegrass
Typical profile:
0 to 6 inches—sandy loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
6 to 14 inches—sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
14 to 35 inches—gravelly sandy loam, sandy loam; 15 to 45 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, SM; estimated AASHTO classification - A-1
35 to 60 inches or more—very gravelly coarse sand; 55 to 65 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GP; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 35 inches—moderately rapid; below this depth—very rapid
Available water capacity: 4.2 to 5.5 inches
Water supplying capacity: 7 to 9 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.32; T value—3; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans on the fan skirts; contrasting feature—does not have a layer of weak silica cementation; distinctive present vegetation—Wyoming big sagebrush, Douglas rabbitbrush, Indian ricegrass
Inclusion 2: Position on landscape—smooth to concave parts of adjacent fan piedmont remnants; contrasting feature—layer of clay accumulation; distinctive present vegetation—Wyoming big sagebrush, Douglas rabbitbrush, Indian ricegrass
Inclusion 3: Position on landscape—alluvial flat remnants; contrasting feature—salt- and sodium-affected throughout the profile; distinctive present vegetation—shadscale, black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 90)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good

TABLE 90.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Silverado	1	2	3
Indian ricegrass	ORHY	20-30	20-30	20-30	---
Needleandthread	STCO4	10-20	10-20	10-20	---
Bottlebrush squirreltail	SIHY	5-10	5-10	5-10	7-10
Sandberg bluegrass	POSE	2-5	2-5	2-5	---
Inland saltgrass	DIST	---	---	---	T-2
Basin wildrye	ELCI2	---	---	---	T-2
Other perennial grasses	PPGG	5-10	5-10	5-10	---
Miterwort	NITRO	---	---	---	2-3
Other perennial forbs	PPFF	2-5	2-5	2-5	T-3
Wyoming big sagebrush	ARTRW*	15-20	15-20	15-20	---
Shadscale	ATCO	---	---	---	30-40
Bud sagebrush	ARSP5	---	---	---	5-10
Black greasewood	SAVE4	---	---	---	20-30
Seepweed	SUAED	---	---	---	5-15
Other shrubs	SSSS	5-10	5-10	5-10	---
Range site symbol		028B010N	028B010N	028B010N	024X003N
Potential production (lb/acre):					
Favorable years		800	800	800	600
Normal years		600	600	600	450
Unfavorable years		400	400	400	300

Daily cover for landfill: Poor—seepage, small stones, too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: IVs, irrigated, and VIIc, nonirrigated
Range site symbol: 028B010N

630—Jesse Camp silt loam

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 6,000 to 6,500 feet
Climatic data (average annual):
Precipitation—about 8 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Jesse Camp silt loam, 0 to 2 percent slopes (Xerollic Camborthids - fine-silty, mixed, frigid)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Hayeston sandy loam, 0 to 4 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—10 percent
Inclusion 2: Molion loam, 0 to 4 percent slopes (Haploxerollic Durorthids - loamy-skeletal, mixed, frigid, shallow)—3 percent
Inclusion 3: Fenster silt loam, 0 to 4 percent slopes (Typic Torriorthents - fine-silty, mixed, frigid)—2 percent

Jesse Camp Soil

Positions on landscape: Inset fans
Parent material: Silty alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth to slightly concave
Dominant present vegetation: Basin big sagebrush, basin wildrye, rabbitbrush
Typical profile:
0 to 10 inches—silt loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4
10 to 60 inches or more—silt loam; massive; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Moderately slow
Available water capacity: 10.4 to 11.1 inches
Water supplying capacity: 8 to 11 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—higher positions on inset fans; contrasting features—fine sandy loam in upper layers, very gravelly in lower layers; distinctive present vegetation—Wyoming big sagebrush, rabbitbrush, Indian ricegrass
Inclusion 2: Position on landscape—adjacent fan piedmonts; contrasting feature—very gravelly over a shallow silica-cemented hardpan; distinctive present vegetation—black sagebrush, winterfat, Indian ricegrass
Inclusion 3: Position on landscape—margins of inset fans; contrasting feature—moderately saline throughout the profile; distinctive present vegetation—shadscale, bud sagebrush, Indian ricegrass

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 91)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Fair—low strength, shrink-swell
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIc, irrigated, and VIc, nonirrigated
Range site symbol: 028B003N

TABLE 91.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Jesse Camp	1	2	3
Basin wildrye	ELCI2	30-50	---	2-5	---
Wheatgrass	AGROP2	2-5	---	---	---
Nevada bluegrass	PONE3	2-5	---	---	---
Indian ricegrass	ORHY	---	20-30	15-25	5-10
Needleandthread	STCO4	---	10-20	5-10	5-10
Bottlebrush squirreltail	SIHY	---	5-10	---	2-5
Sandberg bluegrass	POSE	---	2-5	---	---
Bluebunch wheatgrass	AGSP	---	---	2-5	---
Other perennial grasses	PPGG	15-25	5-10	10-20	5-10
Perennial forbs	PPFF	2-5	2-5	5-10	5-10
Basin big sagebrush	ARTRT*	5-10	---	---	---
Wyoming big sagebrush	ARTRW*	1-2	15-20	---	---
Black sagebrush	ARARN	---	---	20-30	---
Bud sagebrush	ARSP5	---	---	2-5	5-10
Winterfat	EULA5	---	---	5-10	2-5
Small rabbitbrush	CHVIS	---	---	2-5	---
Shadscale	ATCO	---	---	---	30-40
Fourwing saltbush	ATCA2	---	---	---	3-5
Other shrubs	SSSS	5-8	5-10	10-20	5-15
Range site symbol		028B003N	028B010N	028B011N	028B017N
Potential production (lb/acre):					
Favorable years		2,600	800	900	700
Normal years		1,250	600	700	500
Unfavorable years		800	400	400	250

641—Valcrest-Tomera association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 5,200 to 6,000 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Valcrest loam, 2 to 8 percent slopes (Xerollic Natrargids - fine, montmorillonitic, mesic)—50 percent
Tomera gravelly fine sandy loam, cemented substratum, 2 to 8 percent slopes (Xerollic Natrargids - fine, montmorillonitic, mesic)—35 percent
Contrasting inclusions as follows:
Inclusion 1: Durixerollic Haplargids, 2 to 8 percent slopes (Durixerollic Haplargids - loamy-skeletal, mixed, mesic)—5 percent
Inclusion 2: Haploxerollic Durargids, 2 to 8 percent slopes (Haploxerollic Durargids - fine, montmorillonitic, mesic—5 percent
Inclusion 3: Durorthidic Xeric Torriorthents, 8 to 15 percent slopes (Durorthidic Xeric Torriorthents - coarse-silty, mixed, mesic)—5 percent

Valcrest Soil

Positions on landscape: Lower part of fan piedmonts
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, spiny hopsage, Douglas rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail
Typical profile:
0 to 10 inches—loam; 0 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification - CL; estimated AASHTO classification - A-6
10 to 29 inches—clay loam, clay; 0 to 25 percent pebbles (by weight); prismatic structure; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CL; estimated AASHTO classification - A-7
29 to 60 inches or more—sandy loam, gravelly sandy loam; 10 to 45 percent pebbles (by weight); massive; soft, very friable; very strongly alkaline (pH 9.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2, A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 7.1 to 8.6 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.32; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Moderate

Tomera Soil

Positions on landscape: Upper part of fan piedmonts
Parent material: Kind—alluvium; source—mixed sedimentary rocks, pyroclastic material
Dominant present vegetation: Wyoming big sagebrush, spiny hopsage, Douglas rabbitbrush, Sandberg bluegrass
Typical profile:
0 to 9 inches—gravelly fine sandy loam; 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-2, A-4
9 to 31 inches—clay, gravelly clay; 10 to 45 percent pebbles (by weight); prismatic structure; very hard, firm; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - GC, CL, CH; estimated AASHTO classification - A-1
31 to 45 inches—very gravelly sandy loam; 25 to 30 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
45 to 60 inches or more—indurated hardpan
Range in depth to hardpan: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 4.6 to 5.5 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: D

Erosion factors (upper layer): K value—0.20; T value—3; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—dissected side slopes of fan piedmonts; contrasting features—very gravelly throughout the profile, layer of weak silica cementation; distinctive present vegetation—Wyoming big sagebrush, spiny hopsage, Douglas rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail
Inclusion 2: Position on landscape—smooth summits of higher erosional fan piedmonts; contrasting feature—strongly silica-cemented hardpan at a depth of 20 to 40 inches; distinctive present vegetation—Wyoming big sagebrush, spiny hopsage, Douglas rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail
Inclusion 3: Position on landscape—toe slopes of adjacent hills; contrasting features—silty throughout the profile, slopes of 8 to 15 percent; distinctive present vegetation—Wyoming big sagebrush, spiny hopsage, Douglas rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 92)

Elements of Wildlife Habitat

Suitability of Valcrest soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Suitability of Tomera soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

TABLE 92.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Valcrest	Tomera	1	2	3
Bluebunch wheatgrass	AGSP	10-40	10-40	10-40	10-40	10-40
Thurber needlegrass	STTH2	10-40	10-40	10-40	10-40	10-40
Basin wildrye	ELCI2	5-15	5-15	5-15	5-15	5-15
Indian ricegrass	ORHY	2-10	2-10	2-10	2-10	2-10
Webber ricegrass	ORWE	2-10	2-10	2-10	2-10	2-10
Bluegrass	POA++	2-10	2-10	2-10	2-10	2-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10
Perennial forbs	PPFF	5-10	5-10	5-10	5-10	5-10
Big sagebrush	ARTR2	10-15	10-15	10-15	10-15	10-15
Other shrubs	SSSS	5-15	5-15	5-15	5-15	5-15
Range site symbol		025X019N	025X019N	025X019N	025X019N	025X019N
Potential production (lb/acre):						
Favorable years		800	800	800	800	800
Normal years		600	600	600	600	600
Unfavorable years		400	400	400	400	400

Ratings for Selected Uses

Valcrest Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess sodium
Roadfill: Good
Daily cover for landfill: Fair—small stones
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—excess sodium
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Tomera Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—excess sodium
Roadfill: Poor—low strength, shrink-swell
Daily cover for landfill: Poor—hard to pack
Shallow excavations: Moderate—cemented pan, too clayey
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—excess sodium
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIIe, irrigated, and VIIs, nonirrigated
Range site symbol: 025X019N

651—Barrier-Kobeh association

Map Unit Setting

Positions on landscape: Dissected fan piedmonts
Elevation: 6,800 to 7,400 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 45 degrees F
Frost-free season—about 90 days

Composition

Barrier cobbly loam, 4 to 15 percent slopes (Haploxerollic Durorthids - loamy, mixed, frigid, shallow)—65 percent
Kobeh gravelly fine sandy loam, 2 to 8 percent slopes (Durixerollic Camborthids - loamy-skeletal, mixed, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Durargids, 2 to 8 percent slopes (Xerollic Durargids - loamy, mixed, frigid, shallow)—8 percent
Inclusion 2: Haploxerollic Durorthids, 2 to 8 percent slopes (Haploxerollic Durorthids - loamy-skeletal, mixed, frigid)—5 percent
Inclusion 3: Haploxerollic Nadurargids, 2 to 8 percent slopes (Haploxerollic Nadurargids - fine, montmorillonitic, frigid)—2 percent

Barrier Soil

Positions on landscape: Summits and side slopes of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth to concave
Dominant present vegetation: Black sagebrush, Indian ricegrass, shadscale
Typical profile:
0 to 5 inches—cobbly loam; 15 to 30 percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
5 to 15 inches—fine sandy loam, loam, gravelly sandy loam; 15 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - SM, GM; estimated AASHTO classification - A-2, A-4
15 to 45 inches or more—cemented hardpan
Range in depth to hardpan: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 1.4 to 2.0 inches
Water supplying capacity: 8 to 9 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—1; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Kobeh Soil

Positions on landscape: Inset fans
Parent material: Mixed alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, Indian ricegrass, bottlebrush squirreltail
Typical profile:
0 to 7 inches—gravelly fine sandy loam; 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-1, A-2
7 to 15 inches—gravelly sandy loam, gravelly fine sandy loam; 30 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-1, A-2
15 to 60 inches or more—stratified gravelly fine sandy loam to very gravelly sand; 50 to 65 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GP-GM, GM, SP-SM, SM; estimated AASHTO classification - A-1
Depth to seasonal high water table: 4.4 to 5.6 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 8 to 10 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.17; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low

Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—slightly convex shoulders and side slopes of fan piedmont remnants; contrasting feature—layer of clay accumulation; distinctive present vegetation—black sagebrush, Indian ricegrass
Inclusion 2: Position on landscape—slightly concave foot slopes of fan piedmont remnants; contrasting feature—hardpan at a depth of 20 to 40 inches; distinctive present vegetation—black sagebrush, Indian ricegrass
Inclusion 3: Position on landscape—convex summits of fan piedmont remnants; contrasting feature—layer of sodium-affected clay accumulation over a hardpan at a depth of 20 to 40 inches; distinctive present vegetation—shadscale, bud sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 93)

Elements of Wildlife Habitat

Suitability of Barrier soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Kobeh soil for named elements:
Grain and seed crops (irrigated)—fair

TABLE 93.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Barrier	Kobeh	1	2	3
Indian ricegrass	ORHY	15-25	20-30	15-25	15-25	5-10
Needleandthread	STCO4	5-10	10-20	5-10	5-10	5-10
Bluebunch wheatgrass	AGSP	2-5	---	2-5	2-5	---
Basin wildrye	ELCI2	2-5	---	2-5	2-5	---
Bottlebrush squirreltail	SIHY	---	5-10	---	---	2-5
Sandberg bluegrass	POSE	---	2-5	---	---	---
Other perennial grasses	PPGG	10-20	5-10	10-20	10-20	5-10
Perennial forbs	PPFF	5-10	2-5	5-10	5-10	5-10
Black sagebrush	ARARN	20-30	---	20-30	20-30	---
Bud sagebrush	ARSP5	2-5	---	2-5	2-5	5-10
Winterfat	EULA5	5-10	---	5-10	5-10	2-5
Small rabbitbrush	CHVIS	2-5	---	2-5	2-5	---
Wyoming big sagebrush	ARTRW*	---	15-20	---	---	---
Shadscale	ATCO	---	---	---	---	30-40
Fourwing saltbush	ATCA2	---	---	---	---	3-5
Other shrubs	SSSS	10-20	5-10	10-20	10-20	5-15
Range site symbol		028B011N	028B010N	028B011N	028B011N	028B017N
Potential production (lb/acre):						
Favorable years		900	800	900	900	700
Normal years		700	600	700	700	500
Unfavorable years		400	400	400	400	250

Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—very poor
Shallow water areas—very poor

Ratings for Selected Uses

Barrier Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Moderate—cemented pan, slope, frost action
Pond reservoir areas: Severe—cemented pan, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Kobeh Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: Barrier soil—VIIs, nonirrigated; Kobeh soil—IVe, irrigated, and VIIc, nonirrigated
Range site symbol: Barrier soil—028B011N; Kobeh soil—028B010N

661—Akerue-Simpark-Robson association

Map Unit Setting

Positions on landscape: Lower crests and side slopes of mountains
Elevation: 6,200 to 7,000 feet
Climatic data (average annual):
Precipitation—about 11 inches
Air temperature—about 44 degrees F
Frost-free season—about 70 days

Composition

Akerue very stony loam, 15 to 30 percent slopes (Xerollic Durargids - clayey-skeletal, montmorillonitic, frigid, shallow)—40 percent
Simpark very stony loam, 15 to 50 percent slopes (Xerollic Durargids - loamy-skeletal, mixed, frigid, shallow)—35 percent
Robson very stony loam, 8 to 30 percent slopes (Lithic Xerollic Haplargids - clayey-skeletal, montmorillonitic, frigid)—10 percent
Contrasting inclusions as follows:
Inclusion 1: Lithic Xeric Torriorthents, 15 to 75 percent slopes—5 percent
Inclusion 2: Aridic Argixerolls, 8 to 15 percent slopes—5 percent
Inclusion 3: Rock outcrop—5 percent

Akerue Soil

Positions on landscape: South- and west-facing crests and side slopes of mountains
Parent material: Kind—residuum; source—andesite, rhyolite, quartzite
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, small rabbitbrush, Thurber needlegrass, Indian ricegrass
Typical profile:
0 to 6 inches—very stony loam; 30 to 40 percent cobbles and stones and 35 to 45 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC; estimated AASHTO classification - A-4
6 to 18 inches—very cobbly clay loam, very cobbly clay; 40 to 55 percent cobbles and stones and 20 to 50 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, SC, CL; estimated AASHTO classification - A-7
18 to 20 inches—cemented hardpan
20 inches—unweathered bedrock
Range in depth to hardpan: 14 to 20 inches
Range in depth to bedrock: 15 to 26 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—slow
Available water capacity: 1.9 to 2.3 inches
Water supplying capacity: 8 to 9 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.15; T value—1; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Simpark Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—rhyolite
Slope features: Length—long; shape—smooth to convex
Dominant present vegetation: Black sagebrush, small rabbitbrush, Thurber needlegrass, Indian ricegrass
Typical profile:
0 to 5 inches—very stony loam; 25 to 40 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2, A-4
5 to 19 inches—very cobbly loam, very gravelly loam; 10 to 40 percent cobbles and stones and 35 to 70 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, SC; estimated AASHTO classification - A-2, A-6
19 to 21 inches—indurated hardpan
21 inches—unweathered bedrock
Range in depth to hardpan: 16 to 20 inches
Range in depth to bedrock: 20 to 23 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 1.6 to 2.0 inches
Water supplying capacity: 8 to 9 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.17; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Robson Soil

Positions on landscape: Lower side slopes of mountains
Parent material: Kind—residuum; source—rhyolite, andesite, tuff
Slope features: Length—long; shape—smooth to concave
Dominant present vegetation: Low sagebrush, small rabbitbrush, Sandberg bluegrass
Typical profile:
0 to 10 inches—very stony loam; 15 to 30 percent cobbles and stones and 10 to 35 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, SM-SC, CL, CL-ML; estimated AASHTO classification - A-4, A-6
10 to 14 inches—very cobbly clay loam; 30 to 45 percent cobbles and stones and 40 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-7
14 to 19 inches—very cobbly clay, extremely cobbly clay; 50 to 80 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; very hard, very firm; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GM; estimated AASHTO classification - A-7
19 inches—unweathered bedrock
Range in depth to bedrock: 12 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 1.8 to 2.5 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—1; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—crests and side slopes of mountains; contrasting features—does not have a layer of clay accumulation or a silica-cemented hardpan; distinctive present vegetation—low sagebrush, Idaho fescue
Inclusion 2: Position on landscape—concave coalescent toe slopes of mountains; contrasting features—very deep, thick and dark-colored upper layer; distinctive present vegetation—big sagebrush, Thurber needlegrass
Inclusion 3: Position on landscape—crests and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 94)

Elements of Wildlife Habitat

Suitability of Akerue soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Simpark soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Robson soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Akerue Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, large stones
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, large stones, slope
Shallow excavations: Severe—depth to rock, cemented pan, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, cemented pan, slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Simpark Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, large stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, cemented pan, slope

TABLE 94.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Akerue	Simpark	Robson	1	2	3
Indian ricegrass	ORHY	5-15	5-15	5-10	2-5	5-10	---
Needleandthread	STCO4	5-15	5-15	---	---	2-5	---
Pine bluegrass	POSC	2-5	2-5	---	5-10	2-5	---
Bluebunch wheatgrass	AGSP	1-3	1-3	2-5	5-10	5-10	---
Thurber needlegrass	STTH2	---	---	5-10	2-5	20-30	---
Sandberg bluegrass	POSE	---	---	5-10	---	2-5	---
Bottlebrush squirreltail	SIHY	---	---	2-5	2-5	---	---
Idaho fescue	FEID	---	---	---	10-15	---	---
Letterman needlegrass	STLE4	---	---	---	2-5	---	---
Western wheatgrass	AGSM	---	---	---	---	1-2	---
Other perennial grasses	PPGG	5-10	5-10	5-10	10-15	5-8	---
Tapertip hawksbeard	CRAC2	---	---	---	---	2-5	---
Arrowleaf balsamroot	BASA3	---	---	---	---	2-5	---
Lupine	LUPIN	---	---	---	---	2-5	---
White stoneseed	LIRU4	---	---	---	---	1-5	---
Other perennial forbs	PPFF	5-15	5-15	5-10	5-10	---	---
Annual forbs	AAFF	---	---	1-2	---	2-5	---
Black sagebrush	ARARN	20-25	20-25	---	---	---	---
Fourwing saltbush	ATCA2	2-5	2-5	---	---	---	---
Bud sagebrush	ARSP5	2-5	2-5	---	---	---	---
Low sagebrush	ARAR8	---	---	25-30	20-35	---	---
Low rabbitbrush	CHVIH2	---	---	---	2-5	---	---
Snowberry	SYMPH	---	---	---	2-5	---	---
Horsebrush	TETRA3	---	---	---	2-5	---	---
Big sagebrush	ARTR2	---	---	---	---	10-15	---
Rabbitbrush	CHRYS9	---	---	---	---	2-5	---
Antelope bitterbrush	PUTR2	---	---	---	---	1-10	---
Other shrubs	SSSS	10-20	10-20	10-15	5-10	5-10	---

Range site symbol	028B016N	028B016N	028B045N	028B038N	028B007N	BARREN
Potential production (lb/acre):						
Favorable years	500	500	800	800	1,000	---
Normal years	250	250	600	600	800	---
Unfavorable years	150	150	400	400	600	---

Local roads and streets: Severe—cemented pan, slope

Pond reservoir areas: Severe—cemented pan, slope

Embankments, dikes, and levees: Severe—large stones, thin layer

Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines

Robson Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, large stones
Roadfill: Poor—depth to rock, large stones
Daily cover for landfill: Poor—depth to rock, large stones, slope
Shallow excavations: Severe—depth to rock, large stones, slope
Local roads and streets: Severe—depth to rock, slope, large stones
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site symbol: Akerue soil—028B016N; Simpark soil—028B016N; Robson soil—028B045N

671—Whirlo gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Positions on landscape: Alluvial fans
Elevation: 4,600 to 5,000 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Whirlo gravelly loam, 2 to 8 percent slopes (Typic Camborthids - loamy-skeletal, mixed, mesic)—90 percent
Contrasting inclusions as follows:
Inclusion 1: Durorthidic Torriorthents, 0 to 2 percent slopes (Durorthidic Torriorthents - fine-silty, mixed (calcareous), mesic)—4 percent
Inclusion 2: Typic Camborthids, 2 to 8 percent slopes (Typic Camborthids - sandy-skeletal, mixed, mesic)—3 percent
Inclusion 3: Typic Nadurargids, 2 to 8 percent slopes (Typic Nadurargids - loamy, mixed, mesic, shallow)—3 percent

Whirlo Soil

Positions on landscape: Alluvial fans
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, cheatgrass, bud sagebrush, bottlebrush squirreltail
Typical profile:
0 to 12 inches—gravelly loam; 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML, GM; estimated AASHTO classification - A-4
12 to 26 inches—very gravelly fine sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
26 to 60 inches or more—extremely gravelly sandy loam, very gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 9.0); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification - GW-GM, GP-GM; estimated AASHTO classification - A-1

Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 4.7 to 5.8 inches
Water supplying capacity: 5 to 8 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.28; T value—5; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans; contrasting feature—silty throughout the profile; distinctive present vegetation—shadscale, cheatgrass, bud sagebrush, bottlebrush squirreltail
Inclusion 2: Position on landscape—on-fan drainageways; contrasting feature—very gravelly and sandy throughout the profile; distinctive present vegetation—shadscale, cheatgrass, bud sagebrush, bottlebrush squirreltail
Inclusion 3: Position on landscape—adjacent smooth fan piedmonts; contrasting features—shallow to a silica-cemented hardpan, layer of clay accumulation over hardpan; distinctive present vegetation—shadscale, cheatgrass, bud sagebrush, bottlebrush squirreltail

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 95)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Slight
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

TABLE 95.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Whirlo	1	2	3
Indian ricegrass	ORHY	5-15	5-15	5-15	5-15
Bottlebrush squirreltail	SIHY	5-10	5-10	5-10	5-10
Bluegrass	POA++	2-5	2-5	2-5	2-5
Globemallow	SPHAE	2-3	2-3	2-3	2-3
Other perennial forbs	PPFF	2-4	2-4	2-4	2-4
Shadscale	ATCO	30-35	30-35	30-35	30-35
Bud sagebrush	ARSP5	25-30	25-30	25-30	25-30
Other shrubs	SSSS	2-5	2-5	2-5	2-5
Range site symbol		024X002N	024X002N	024X002N	024X002N
Potential production (lb/acre):					
Favorable years		700	700	700	700
Normal years		450	450	450	450
Unfavorable years		300	300	300	300

Interpretive Groups

Range site symbol: 024X002N

Capability classification: IIIe, irrigated, and VIIc, nonirrigated

672—Whirlo-Creemon association

Map Unit Setting

Positions on landscape: Fan skirts
Elevation: 4,600 to 5,000 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Whirlo gravelly loam, 2 to 4 percent slopes (Typic Camborthids - loamy-skeletal, mixed, mesic)—45 percent
Creemon silt loam, 0 to 2 percent slopes (Duric Camborthids - coarse-silty, mixed, mesic)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Typic Camborthids, 2 to 4 percent slopes (Typic Camborthids - sandy-skeletal, mixed, mesic)—5 percent
Inclusion 2: Typic Camborthids, strongly saline, 0 to 4 percent slopes (Typic Camborthids - sandy-skeletal, mixed, mesic)—5 percent
Inclusion 3: Typic Nadurargids, 0 to 4 percent slopes (Typic Nadurargids - loamy, mixed, mesic, shallow)—5 percent

Whirlo Soil

Positions on landscape: Higher fan skirts near channels
Parent material: Mixed alluvium strongly influenced by loess
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, cheatgrass
Typical profile:
0 to 12 inches—gravelly loam; 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML, GM; estimated AASHTO classification - A-4
12 to 26 inches—very gravelly fine sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
26 to 60 inches or more—extremely gravelly sandy loam, very gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 9.0); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification - GW-GM, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 4.7 to 5.8 inches
Water supplying capacity: 5 to 8 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.28; T value—5; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Creemon Soil

Positions on landscape: Lower fan skirts
Parent material: Silty mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, cheatgrass
Typical profile:
0 to 5 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4
5 to 11 inches—very fine sandy loam, silt loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification - ML; estimated AASHTO classification - A-4
11 to 60 inches or more—stratified very fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification - ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 10.2 to 12.1 inches
Water supplying capacity: 5 to 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6

Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—channel banks on the upper part of fan skirts; contrasting feature—very gravelly and sandy throughout the profile; distinctive present vegetation—bottlebrush squirreltail, cheatgrass
Inclusion 2: Position on landscape—channel banks on the lower part of fan skirts; contrasting features—strongly saline, very gravelly and sandy throughout the profile; distinctive present vegetation—black greasewood, bottlebrush squirreltail
Inclusion 3: Position on landscape—smooth summits of adjacent fan piedmonts; contrasting features—layer of sodium-affected clay accumulation over a hardpan, shallow to a hardpan; distinctive present vegetation—shadscale, bud sagebrush, bottlebrush squirreltail, cheatgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 96)

Elements of Wildlife Habitat

Suitability of Whirlo soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Creemon soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor

TABLE 96.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Whirlo	Creemon	1	2	3
Indian ricegrass	ORHY	5-15	5-15	5-15	---	5-15
Bottlebrush squirreltail	SIHY	5-10	5-10	5-10	7-10	5-10
Bluegrass	POA++	2-5	2-5	2-5	---	2-5
Inland saltgrass	DIST	---	---	---	T-2	---
Basin wildrye	ELCI2	---	---	---	T-2	---
Globemallow	SPHAE	2-3	2-3	2-3	---	2-3
Miterwort	NITRO	---	---	---	2-3	---
Other perennial forbs	PPFF	2-4	2-4	2-4	T-3	2-4
Shadscale	ATCO	30-35	30-35	30-35	30-40	30-35
Bud sagebrush	ARSP5	25-30	25-30	25-30	5-10	25-30
Black greasewood	SAVE4	---	---	---	20-30	---
Seepweed	SUAED	---	---	---	5-15	---
Other shrubs	SSSS	2-5	2-5	2-5	---	2-5
Range site symbol		024X002N	024X002N	024X002N	024X003N	024X002N
Potential production (lb/acre):						
Favorable years		700	700	700	600	700
Normal years		450	450	450	450	450
Unfavorable years		300	300	300	300	300

Ratings for Selected Uses

Whirlo Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Slight
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Creemon Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Slight
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Whirlo soil—IIe, irrigated, and VIIc, nonirrigated; Creemon soil—IIc, irrigated, and VIIc, nonirrigated
Range site symbol: 024X002N

681—Chad-Cleavage-Softscrabble association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 7,000 to 8,000 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Chad cobbly loam, 15 to 30 percent slopes (Aridic Argixerolls - fine, mixed, frigid)—45 percent
Cleavage gravelly loam, 8 to 15 percent slopes (Lithic Argixerolls - loamy-skeletal, mixed, frigid)—20 percent
Softscrabble stony fine sandy loam, 8 to 15 percent slopes (Pachic Argixerolls - loamy-skeletal, mixed, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—5 percent
Inclusion 2: Welch loam, drained, 2 to 15 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—5 percent
Inclusion 3: Xerollic Haplargids, 2 to 15 percent slopes—5 percent

Chad Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—shale influenced by loess and volcanic ash
Slope features: Length—long; shape—smooth to convex
Dominant present vegetation: Big sagebrush, serviceberry, bluebunch wheatgrass, Sandberg bluegrass
Typical profile:
0 to 17 inches—cobbly loam; 15 to 25 percent cobbles and stones and 25 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
17 to 42 inches—gravelly clay, gravelly clay loam, clay, clay loam; 0 to 5 percent cobbles and stones and 15 to 45 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, MH, SM, SC; estimated AASHTO classification - A-7
42 inches—weathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 4.7 to 5.9 inches
Water supplying capacity: 13 to 15 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.28; T value—3; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—low; to concrete—low
Potential frost action: Low

Cleavage Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—chert, shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, black sagebrush, Sandberg bluegrass, bottlebrush squirreltail
Typical profile:
0 to 7 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, SC; estimated AASHTO classification - A-2, A-4, A-6
7 to 14 inches—very cobbly clay loam, extremely cobbly sandy clay loam, very gravelly clay loam; 10 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
14 inches—unweathered bedrock
Range in depth to bedrock: 14 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 1.7 to 2.0 inches
Water supplying capacity: 10 to 12 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—1; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low

Potential frost action: Moderate

Softscrabble Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum, colluvium; source—volcanic rock
Slope features: Length—short; shape—concave
Dominant present vegetation: Mountain big sagebrush, snowberry, basin wildrye, Idaho fescue
Typical profile:
0 to 20 inches—stony fine sandy loam; 5 to 15 percent cobbles and stones and 0 to 20 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
20 to 38 inches—extremely gravelly clay loam, very gravelly clay loam; 10 to 25 percent cobbles and stones and 45 to 70 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
38 to 60 inches or more—very gravelly loam, very gravelly clay loam, extremely gravelly loam; 10 to 25 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GM; estimated AASHTO classification - A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 6.2 to 7.4 inches
Water supplying capacity: 14 to 16 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—crests of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren
Inclusion 2: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, moderately wet, very thick and dark colored upper layer; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 3: Position on landscape—convex crests of mountains near rock outcrops; contrasting feature—light-colored upper layer less than 7 inches thick; distinctive present vegetation—low sagebrush, pine bluegrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 97)

Elements of Wildlife Habitat

Suitability of Chad soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Cleavage soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Softscrabble soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Chad Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—shrink-swell
Daily cover for landfill: Poor—too clayey, hard to pack, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—piping, hard to pack
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Cleavage Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, small stones
Shallow excavations: Severe—depth to rock
Local roads and streets: Severe—depth to rock
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Softscrabble Soil

Suitability and limitations for the following uses:
Rangeland seeding: Good

TABLE 97.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Chad	Cleavage	Softscrabble	1	2	3
Bluebunch wheatgrass	AGSP	10-15	10-15	10-20	---	---	5-10
Thurber needlegrass	STTH2	5-10	2-5	5-10	---	---	2-5
Basin wildrye	ELCI2	5-10	---	2-5	---	30-50	---
Western wheatgrass	AGSM	1-4	2-5	1-5	---	5-10	---
Sandberg bluegrass	POSE	2-5	2-5	---	---	---	---
Idaho fescue	FEID	---	2-5	2-5	---	2-5	---
Bottlebrush squirreltail	SIHY	---	1-2	---	---	2-5	---
Indian ricegrass	ORHY	---	5-10	---	---	2-5	---
Letterman needlegrass	STLE4	---	1-2	---	---	---	---
Pine bluegrass	POSC	---	---	2-5	---	5-10	---
Nevada bluegrass	PONE3	---	---	---	---	5-10	---
Other perennial grasses	PPGG	10-15	2-5	10-20	---	5-15	10-15
Perennial forbs	PPFF	5-15	5-10	5-12	---	5-10	10-15
Mountain big sagebrush	ARTRV	15-25	---	15-25	---	1-2	---
Serviceberry	AMELA	3-10	---	2-10	---	---	---
Antelope bitterbrush	PUTR2	2-8	---	5-10	---	---	---
Low sagebrush	ARAR8	---	20-35	---	---	25-30	---
Snowberry	SYMPH	---	2-5	---	---	---	---
Horsebrush	TETRA3	---	2-5	1-2	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	5-10	---
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5	---
Other shrubs	SSSS	15-20	5-10	5-15	---	5-10	10-20
Range site symbol		028B027N	028B034N	028B030N	BARREN	028B024N	028B037N
Potential production (lb/acre):							
Favorable years		900	600	1,100	---	2,800	700
Normal years		600	400	800	---	1,700	500
Unfavorable years		300	250	600	---	1,000	300

Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Moderate—slope
Local roads and streets: Moderate—slope, frost action
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—seepage, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Chad soil—VIe, nonirrigated; Cleavage soil—VIIs, nonirrigated; Softscrabble soil—VIIs, nonirrigated
Range site symbol: Chad soil—028B027N; Cleavage soil—028B034N; Softscrabble soil—028B030N

682—Chad-Gando-Softscrabble association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 6,200 to 7,800 feet
Climatic data (average annual):
Precipitation—about 16 inches
Air temperature—about 43 degrees F
Frost-free season—about 70 days

Composition

Chad cobbly loam, 15 to 50 percent slopes (Aridic Argixerolls - fine, mixed, frigid)—45 percent
Gando stony loam, 15 to 30 percent slopes (Lithic Haploxerolls - loamy-skeletal, mixed, frigid)—20 percent
Softscrabble stony fine sandy loam, 15 to 30 percent slopes (Pachic Argixerolls - loamy-skeletal, mixed, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Walti stony loam, 8 to 30 percent slopes (Aridic Argixerolls - fine, montmorillonitic, frigid)—5 percent
Inclusion 2: Rock outcrop—5 percent
Inclusion 3: Welch loam, drained, 4 to 8 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—3 percent
Inclusion 4: Welch loam, 2 to 8 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—2 percent

Chad Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—shale influenced by loess and volcanic ash
Slope features: Length—long; shape—convex
Dominant present vegetation: Mountain big sagebrush, small rabbitbrush, serviceberry, bluebunch wheatgrass
Typical profile:
0 to 17 inches—cobbly loam; 15 to 25 percent cobbles and stones and 25 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
17 to 42 inches—gravelly clay, gravelly clay loam, clay, clay loam; 0 to 5 percent cobbles and stones and 5 to 45 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, MH, SM, SC; estimated AASHTO classification - A-7
42 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 4.7 to 5.9 inches
Water supplying capacity: 13 to 15 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.28; T value—3; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—low; to concrete—low
Potential frost action: Low

Gando Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—chert
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, black sagebrush, Indian ricegrass, Thurber needlegrass, basin wildrye
Typical profile:
0 to 5 inches—stony loam; 10 to 15 percent cobbles and stones and 15 to 25 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-4
5 to 15 inches—very gravelly loam, extremely gravelly loam; 10 to 25 percent cobbles and stones and 60 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
15 inches—unweathered bedrock
Range in depth to bedrock: 12 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 1.2 to 1.4 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—1; wind erodibility group—6

Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Softscrabble Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum, colluvium; source—volcanic rock
Slope features: Length—long; shape—concave
Dominant present vegetation: Mountain big sagebrush, Idaho fescue, snowberry, basin wildrye
Typical profile:
0 to 20 inches—stony fine sandy loam; 5 to 15 percent cobbles and stones and 0 to 20 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
20 to 38 inches—extremely gravelly clay loam, very gravelly clay loam; 10 to 25 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
38 to 60 inches or more—very gravelly loam, very gravelly clay loam, extremely gravelly loam; 10 to 25 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GM; estimated AASHTO classification - A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 6.2 to 7.4 inches
Water supplying capacity: 14 to 16 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—concave crests and upper side slopes of mountains; contrasting feature—moderately deep to bedrock; distinctive present vegetation—low sagebrush, pine bluegrass
Inclusion 2: Position on landscape—crests and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren
Inclusion 3: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, moderately wet; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 4: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, wet; distinctive present vegetation—sedges, willows, tufted hairgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 98)

Elements of Wildlife Habitat

Suitability of Chad soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Gando soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Softscrabble soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Chad Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—slope, shrink-swell
Daily cover for landfill: Poor—too clayey, hard to pack, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—piping, hard to pack
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Gando Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope

TABLE 98.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Chad	Gando	Softscrabble	1	2	3	4
Bluebunch wheatgrass	AGSP	10-15	10-15	10-20	---	5-10	---	---
Thurber needlegrass	STTH2	5-10	2-5	5-10	---	2-5	---	---
Basin wildrye	ELCI2	5-10	---	2-5	30-50	---	---	---
Western wheatgrass	AGSM	1-4	2-5	1-5	5-10	---	---	---
Sandberg bluegrass	POSE	2-5	2-5	---	---	---	---	---
Idaho fescue	FEID	---	2-5	2-5	---	2-5	---	---
Bottlebrush squirreltail	SIHY	---	1-2	---	---	2-5	---	---
Indian ricegrass	ORHY	---	5-10	---	---	2-5	---	---
Letterman needlegrass	STLE4	---	1-2	---	---	---	---	---
Pine bluegrass	POSC	---	---	2-5	---	5-10	---	---
Nevada bluegrass	PONE3	---	---	---	5-10	---	---	5-10
Tufted hairgrass	DECA5	---	---	---	---	---	---	30-60
Sedge	CAREX	---	---	---	---	---	---	5-10
Alpine timothy	PHAL2	---	---	---	---	---	---	5-10
Other perennial grasses	PPGG	10-15	2-5	10-20	5-15	10-15	---	2-10
Sierra clover	TRWO	---	---	---	---	---	---	2-5
Cinquefoil	POTEN	---	---	---	---	---	---	2-5
Other perennial forbs	PPFF	5-15	5-10	5-12	5-10	10-15	---	10-20
Mountain big sagebrush	ARTRV	15-25	---	15-25	1-2	---	---	---
Serviceberry	AMELA	3-10	---	2-10	---	---	---	---
Antelope bitterbrush	PUTR2	2-8	---	5-10	---	---	---	---
Low sagebrush	ARAR8	---	20-35	---	---	25-30	---	---
Snowberry	SYMPH	---	2-5	---	---	---	---	---
Horsebrush	TETRA3	---	2-5	1-2	---	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	5-10	---	---	---
Rubber rabbitbrush	CHNA2	---	---	---	2-5	---	---	---
Willow	SALIX	---	---	---	---	---	---	2-5
Other shrubs	SSSS	15-20	5-10	5-15	5-10	10-20	---	---

Range site symbol	028B027N	028B034N	028B030N	028B024N	028B037N	BARREN	025X005N
Potential production (lb/acre):							
Favorable years	900	600	1,100	2,800	700	---	2,000
Normal years	600	400	800	1,700	500	---	1,700
Unfavorable years	300	250	600	1,000	300	---	1,000

Embankments, dikes, and levees: Severe—seepage, thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Softscrabble Soil

Suitability and limitations for the following uses:
Rangeland seeding: Good
Roadfill: Fair—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope

Local roads and streets: Severe—slope, frost action
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—seepage, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Chad soil—VIIe, nonirrigated; Gando soil—VIIs, nonirrigated; Softscrabble soil—VIIs, nonirrigated
Range site symbol: Chad soil—028B027N; Gando soil—028B034N; Softscrabble soil—028B030N

691—Ravenswood-Shagnasty-Walti association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 6,000 to 7,500 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Ravenswood extremely stony loam, 15 to 30 percent slopes (Typic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—40 percent
Shagnasty extremely stony loam, 15 to 30 percent slopes (Typic Argixerolls - fine, montmorillonitic, frigid)—25 percent
Walti extremely stony loam, 8 to 15 percent slopes (Aridic Argixerolls - fine, montmorillonitic, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—5 percent
Inclusion 2: Welch loam, drained, 2 to 8 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—5 percent
Inclusion 3: Typic Argixerolls, 2 to 8 percent slopes—5 percent

Ravenswood Soil

Positions on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum, colluvium; source—quartzite, rhyolite, andesite
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, rabbitbrush, bottlebrush squirreltail, bluegrass
Typical profile:
0 to 8 inches—extremely stony loam; 25 to 40 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2, A-4
8 to 13 inches—very gravelly clay loam; 5 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2
13 to 35 inches—very gravelly clay, very gravelly clay loam; 5 to 15 percent cobbles and stones and 50 to 60 percent pebbles (by weight); prismatic structure; very hard, very firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
35 inches—unweathered bedrock
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 4.4 to 6.0 inches
Water supplying capacity: 12 to 13 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.32; T value—2; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Shagnasty Soil

Positions on landscape: North-facing upper side slopes of mountains
Parent material: Kind—residuum, colluvium; source—rhyolite, andesite, quartzite
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, curlleaf mountainmahogany, big sagebrush, snowberry, basin wildrye
Typical profile:
0 to 12 inches—extremely stony loam; 40 to 60 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC, SC; estimated AASHTO classification - A-4, A-6
12 to 36 inches—clay, clay loam; 5 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); prismatic structure; extremely hard, very fine; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
36 to 59 inches—cobbly clay loam, cobbly silty clay loam; 10 to 25 percent cobbles and stones and 15 to 35 percent pebbles (by weight); massive; very hard, firm; slightly acid (pH 6.3); nonsaline

(less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL, CH, MH; estimated AASHTO classification - A-6, A-7
59 inches—weathered bedrock
Range in depth to bedrock: 50 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 6.2 to 8.7 inches
Water supplying capacity: 12 to 15 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—3; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Walti Soil

Positions on landscape: Crests and side slopes of mountains
Parent material: Kind—colluvium, residuum; source—rhyolite, andesite, quartzite
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush, Sandberg bluegrass
Typical profile:
0 to 5 inches—extremely stony loam; 25 to 55 percent cobbles and stones and 55 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC, GM; estimated AASHTO classification - A-2
5 to 9 inches—clay loam, gravelly clay loam; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL; estimated AASHTO classification - A-6
9 to 22 inches—clay, gravelly clay; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - MH, CH; estimated AASHTO classification - A-7
22 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Very slow
Available water capacity: 2.6 to 4.5 inches
Water supplying capacity: 12 to 15 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.10; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—crests and upper side slopes of mountains; contrasting feature—bedrock exposed at the surface; distinctive present vegetation—barren
Inclusion 2: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, moderately wet; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 3: Position on landscape—concave foot slopes of mountains; contrasting feature—bedrock at a depth of more than 60 inches; distinctive present vegetation—mountain big sagebrush, Idaho fescue

Major Uses

Rangeland, wildlife habitat, woodland

Potential Native Plant Community (Table 99)

Woodland

Ravenswood Soil

Site index for common trees: Singleleaf pinyon—50
Most important native understory plants: Thurber needlegrass, Idaho fescue, big sagebrush;

Shagnasty Soil

Site index for common trees: Singleleaf pinyon—55; Utah juniper—55
Most important native understory plants: Thurber needlegrass, Idaho fescue, big sagebrush

Elements of Wildlife Habitat

Suitability of Ravenswood soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Shagnasty soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Walti soil for named elements:
Wild herbaceous plants (nonirrigated)—fair

TABLE 99.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Ravenswood	Shagnasty	Walti	1	2	3
Indian ricegrass	ORHY	X	X	2-5	---	---	---
Needleandthread	STC04	X	X	---	---	---	---
Pine bluegrass	POSC	X	X	5-10	---	---	2-5
Bluebunch wheatgrass	AGSP	X	X	5-10	---	---	10-20
Nevada bluegrass	PONE3	X	X	---	---	5-10	---
Thurber needlegrass	STTH2	X	X	2-5	---	---	5-10
Bottlebrush squirreltail	SIHY	X	X	2-5	---	---	---
Sandberg bluegrass	POSE	X	X	---	---	---	---
Idaho fescue	FEID	---	---	2-5	---	---	2-5
Basin wildrye	ELCI2	---	---	---	---	30-50	2-5
Western wheatgrass	AGSM	---	---	---	---	5-10	1-5
Other perennial grasses	PPGG	X	X	10-15	---	5-15	10-20
Perennial forbs	PPFF	X	X	10-15	---	5-10	5-12
Big sagebrush	ARTR2	X	X	---	---	---	---
Utah juniper	JUOS	X	X	---	---	---	---
Singleleaf pinyon	PIMO	X	X	---	---	---	---
Low sagebrush	ARAR8	---	---	25-30	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	5-10	---
Mountain big sagebrush	ARTRV	---	---	---	---	1-2	15-25
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5	---
Serviceberry	AMELA	---	---	---	---	---	2-10
Antelope bitterbrush	PUTR2	---	---	---	---	---	5-10
Horsebrush	TETRA3	---	---	---	---	---	1-2
Other shrubs	SSSS	X	X	10-20	---	5-10	5-15
Range site symbol		---	---	028B037N	BARREN	028B024N	028B030N
Woodland site symbol		025X062N	025X062N	---	---	---	---
Potential production (lb/acre):							
Favorable years		500	500	700	---	2,800	1,100
Normal years		300	300	500	---	1,700	800
Unfavorable years		250	250	300	---	1,000	600

Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Ravenswood Soil

Suitability and limitations for the following uses:

Rangeland seeding: Poor—large stones

Roadfill: Poor—depth to rock, low strength

Daily cover for landfill: Poor—depth to rock, too clayey, hard to pack

Shallow excavations: Severe—depth to rock, slope

Local roads and streets: Severe—low strength, slope

Pond reservoir areas: Severe—slope

Embankments, dikes, and levees: Severe—large stones

Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Shagnasty Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—low strength, shrink-swell
Daily cover for landfill: Poor—too clayey, hard to pack, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope, low strength, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer, hard to pack, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Walti Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—depth to rock, low strength
Daily cover for landfill: Poor—depth to rock, too clayey
Shallow excavations: Severe—depth to rock
Local roads and streets: Severe—low strength
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site symbol: Walti soil—028B037N
Woodland suitability group: Ravenswood soil—3x; Shagnasty soil—2x

701—Loncan-Gando-Glean association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 6,500 to 8,200 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 43 degrees F
Frost-free season—about 80 days

Composition

Loncan gravelly loam, 15 to 50 percent slopes (Aridic Haploxerolls - loamy-skeletal, mixed, frigid)—40 percent
Gando stony loam, 15 to 30 percent slopes (Lithic Haploxerolls - loamy-skeletal, mixed, frigid)—25 percent
Glean very gravelly loam, 15 to 30 percent slopes (Pachic Haploxerolls - loamy-skeletal, mixed, frigid)—25 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—4 percent
Inclusion 2: Welch loam, drained, 4 to 15 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—3 percent
Inclusion 3: Argic Pachic Cryoborolls, 15 to 30 percent slopes—2 percent
Inclusion 4: Welch loam, 2 to 8 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—1 percent

Loncan Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—colluvium, residuum; source—sedimentary and volcanic rocks
Slope features: Length—short; shape—convex
Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, bluegrass, basin wildrye, rabbitbrush
Typical profile:
0 to 10 inches—gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC, CL; estimated AASHTO classification - A-6
10 to 35 inches—very gravelly loam, very cobbly loam, very gravelly sandy clay loam; 10 to 45 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2
35 inches—unweathered bedrock
Range in depth to bedrock: 21 to 38 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 1.5 to 4.3 inches
Water supplying capacity: 12 to 14 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.17; T value—2; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Gando Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—chert
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush, low rabbitbrush, Sandberg bluegrass, Thurber needlegrass
Typical profile:
0 to 5 inches—stony loam; 10 to 15 percent cobbles and stones and 15 to 25 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
5 to 15 inches—very gravelly loam, extremely gravelly loam; 10 to 25 percent cobbles and stones and 60 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
15 inches—unweathered bedrock
Range in depth to bedrock: 12 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 1.0 to 1.8 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—1; wind erodibility group—6

Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Glean Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—colluvium, residuum; source—chert, shale, volcanic rocks
Slope features: Length—short; shape—concave
Dominant present vegetation: Mountain big sagebrush, Idaho fescue, snowberry, serviceberry, basin wildrye, bluebunch wheatgrass
Typical profile:
0 to 14 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
14 to 56 inches—very gravelly sandy loam, very gravelly loam; 10 to 25 percent cobbles and stones and 40 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
56 inches—unweathered bedrock
Range in depth to bedrock: 50 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 3 to 6 inches
Water supplying capacity: 11 to 15 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.10; T value—3; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—moderate
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—crests and upper side slopes of mountains; contrasting feature—exposed bedrock at the surface; distinctive present vegetation—barren
Inclusion 2: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, moderately wet; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 3: Position on landscape—concave north-facing side slopes of mountains; contrasting feature—receives additional moisture from drifted snow; distinctive present vegetation—chokecherry, snowberry, serviceberry, Idaho fescue
Inclusion 4: Position on landscapes—narrow drainageways of mountains; contrasting features—very deep, wet; distinctive present vegetation—sedge, willow, tufted hairgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 100)

Elements of Wildlife Habitat

Suitability of Loncan soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Gando soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Glean soil for named elements:
Wild herbaceous plants (nonirrigated)—good
Shrubs (nonirrigated)—good

Ratings for Selected Uses

Loncan Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Gando Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—seepage

TABLE 100.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Loncan	Gando	Glean	1	2	3	4
Bluebunch wheatgrass	AGSP	10-20	10-15	10-20	---	---	1-3	---
Basin wildrye	ELCI2	2-5	---	2-5	---	3-50	1-5	---
Pine bluegrass	POSC	2-5	---	2-5	---	---	---	---
Idaho fescue	FEID	2-5	2-5	2-5	---	---	5-10	---
Thurber needlegrass	STTH2	5-10	2-5	5-10	---	---	---	---
Western wheatgrass	AGSM	1-5	2-5	1-5	---	5-10	---	---
Bottlebrush squirreltail	SIHY	---	1-2	---	---	---	---	---
Indian ricegrass	ORHY	---	5-10	---	---	---	---	---
Letterman needlegrass	STLE4	---	1-2	---	---	---	---	---
Sandberg bluegrass	POSE	---	2-5	---	---	---	---	---
Nevada bluegrass	PONE3	---	---	---	---	5-10	---	5-10
Mountain brome	BRMA4	---	---	---	---	---	2-5	---
Tufted hairgrass	DECA5	---	---	---	---	---	---	30-60
Sedge	CAREX	---	---	---	---	---	---	5-10
Alpine timothy	PHAL2	---	---	---	---	---	---	5-10
Other perennial grasses	PPGG	10-20	2-5	10-20	---	5-15	5-15	2-10
Sierra clover	TRWO	---	---	---	---	---	---	2-5
Cinquefoil	POTEN	---	---	---	---	---	---	2-5
Other perennial forbs	PPFF	5-12	5-10	5-12	---	5-10	5-15	0-20
Serviceberry	AMELA	2-10	---	2-10	---	---	2-5	---
Antelope bitterbrush	PUTR2	5-10	---	5-10	---	---	---	---
Horsebrush	TETRA3	1-2	2-5	1-2	---	---	---	---
Mountain big sagebrush	ARTRV	15-25	---	15-25	---	1-2	1-5	---
Low sagebrush	ARAR8	---	20-35	---	---	---	---	---
Snowberry	SYMPH	---	2-5	---	---	---	5-10	---
Basin big sagebrush	ARTRT*	---	---	---	---	5-10	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5	---	---
Common chokecherry	PRVI	---	---	---	---	---	20-30	---
Willow	SALIX	---	---	---	---	---	---	2-5
Other shrubs	SSSS	5-15	5-10	5-15	---	5-10	10-15	---

Range site symbol	028B030N	028B034N	028B030N	BARREN	028B024N	028B026N	025X005N
Potential production (lb/acre):							
Favorable years	1,100	600	1,100	---	2,800	1,400	2,000
Normal years	800	400	800	---	1,700	1,000	1,700
Unfavorable years	600	250	600	---	1,000	700	1,000

Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Glean Soil

Suitability and limitations for the following uses:

Rangeland seeding: Poor—small stones
Roadfill: Fair—depth to rock, thin layer, slope
Daily cover for landfill: Fair—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope

Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Loncan soil—VIIe, nonirrigated; Gando soil—VIIe, nonirrigated; Glean soil—VIIs, nonirrigated
Range site symbol: Loncan soil—028B030N; Gando soil—028B034N; Glean soil—028B030N

711—Singletree Variant-Boulder Lake association

Map Unit Setting

Positions on landscape: Lake plains
Elevation: 7,180 to 7,200 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Singletree Variant fine sandy loam, 0 to 2 percent slopes (Calciorthidic Haploxerolls - fine-loamy, mixed, frigid)—40 percent
Boulder Lake silty clay, 0 to 2 percent slopes (Aquic Chromoxererts - fine, montmorillonitic, frigid)—25 percent
Boulder Lake silty clay, ponded, 0 to 2 percent slopes (Aquic Chromoxererts - fine, montmorillonitic, frigid)—25 percent
Contrasting inclusion as follows:
Inclusion 1: Aridic Haploxerolls, 0 to 2 percent slopes—10 percent

Singletree Variant Soil

Positions on landscape: Lake-plain terraces
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Basin big sagebrush, Douglas rabbitbrush, western wheatgrass, lupine
Typical profile:
0 to 6 inches—fine sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, SM-SC, ML, CL-ML; estimated AASHTO classification - A-4
6 to 26 inches—loam, silty clay loam, clay loam, silt loam; 0 to 25 percent pebbles (by weight); subangular blocky structure; hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL; estimated AASHTO classification - A-6
26 to 60 inches or more—stratified gravelly loam to very gravelly sandy loam; 35 to 60 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Moderately slow
Available water capacity: 7.8 to 8.9 inches
Water supplying capacity: 12 to 15 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.28; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Boulder Lake Soil

Positions on landscape: Outer margins of lake plains
Parent material: Clayey lacustrine sediment
Slope features: Length—long; shape—plane
Dominant present vegetation: Silver sagebrush, mat muhly
Typical profile:
0 to 6 inches—silty clay; platy structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CH; estimated AASHTO classification - A-7
6 to 60 inches or more—clay, silty clay; prismatic structure; very hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CH; estimated AASHTO classification - A-7
Depth to perched water table: 12 inches above surface to 18 inches below surface
Hazard of flooding: None
Permeability: Very slow
Available water capacity: 8.4 to 9.0 inches
Water supplying capacity: 8 to 9 inches
Runoff: Ponded
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—5; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Boulder Lake, Ponded, Soil

Positions on landscape: Lake plains
Parent material: Clayey lacustrine sediment
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Mat muhly, silver sagebrush
Typical profile:
0 to 6 inches—silty clay; platy structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4);

estimated Unified classification - CH; estimated AASHTO classification - A-7
6 to 60 inches or more—clay, silty clay; prismatic structure; very hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CH; estimated AASHTO classification - A-7

Depth to perched water table: Surface to 24 inches above surface
Hazard of flooding: None
Permeability: Very slow
Available water capacity: 8.4 to 9.0 inches
Water supplying capacity: 8 to 9 inches
Runoff: Ponded
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—5; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusion

Inclusion 1: Position on landscape—terminus of inset fans from adjacent fan piedmonts; contrasting feature—coarse textured throughout the profile; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 101)

Elements of Wildlife Habitat

Suitability of Singletree Variant soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Suitability of Boulder Lake soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—good
Shallow water areas—good

Suitability of Boulder Lake, ponded, soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—good
Shallow water areas—good

Ratings for Selected Uses

Singletree Variant Soil

Suitability and limitations for the following uses:
Rangeland seeding: Good
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Moderate—low strength, flooding, frost action
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Slight
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Boulder Lake Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too crusty, too clayey
Roadfill: Poor—low strength, wetness, shrink-swell
Daily cover for landfill: Poor—too clayey, hard to pack, ponding
Shallow excavations: Severe—cutbanks cave, ponding
Local roads and streets: Severe—low strength, ponding, shrink-swell
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—hard to pack, ponding
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Boulder Lake, Ponded, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too crusty, too clayey
Roadfill: Poor—low strength, wetness, shrink-swell
Daily cover for landfill: Poor—too clayey, hard to pack, ponding
Shallow excavations: Severe—cutbanks cave, ponding
Local roads and streets: Severe—low strength, ponding, shrink-swell
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—hard to pack, ponding
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Singletree Variant soil—IIIc, irrigated, and VIc, nonirrigated; Boulder Lake soil—VIw, nonirrigated; Boulder Lake, ponded, soil—VIw, nonirrigated
Range site symbol: Singletree Variant soil—028B024N; Boulder Lake soil—025X048N; Boulder Lake, ponded, soil—025X049N

TABLE 101.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name			Inclusion number--
		Singletree Variant	Boulder Lake	Boulder Lake, ponded	1
Basin wildrye	ELCI2	30-50	---	---	---
Western wheatgrass	AGSM	5-10	---	---	---
Nevada bluegrass	PONE3	5-10	2-5	15-25	---
Mat muhly	MURI	---	20-30	50-70	---
Indian ricegrass	ORHY	---	---	---	20-30
Needleandthread	STCO4	---	---	---	10-20
Bottlebrush squirreltail	SIHY	---	---	---	5-10
Sandberg bluegrass	POSE	---	---	---	2-5
Other perennial grasses	PPGG	5-15	2-5	5-15	5-10
Povertyweed	IVAX	---	2-5	---	---
Other perennial forbs	PPFF	5-10	T-3	---	2-5
Annual forbs	AAFF	---	---	2-7	---
Basin big sagebrush	ARTRT*	5-10	---	---	---
Mountain big sagebrush	ARTRV	1-2	---	---	---
Rubber rabbitbrush	CHNA2	2-5	---	---	---
Silver sagebrush	ARCA13	---	50-65	2-5	---
Wyoming big sagebrush	ARTRW*	---	---	---	15-20
Other shrubs	SSSS	5-10	0-3	---	5-10
Range site symbol		028B024N	025X048N	025X049N	028B010N
Potential production (lb/acre):					
Favorable years		2,800	350	450	800
Normal years		1,700	250	325	600
Unfavorable years		1,000	150	250	400

721—Paranat silt loam, drained, occasionally flooded

Map Unit Setting

Positions on landscape: Flood plains
Elevation: 4,700 to 4,900 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 46 degrees F
Frost-free season—about 110 days

Composition

Paranat silt loam, drained, occasionally flooded, 0 to 2 percent slopes (Fluvaquentic Haplaquolls - fine-silty, mixed (calcareous), mesic)—95 percent
Contrasting inclusions as follows:
Inclusion 1: Aeric Halaquepts, 0 to 2 percent slopes—3 percent
Inclusion 2: Xeric Torriorthents, 0 to 2 percent slopes (Xeric Torriorthents - fine-silty, mixed (calcareous), mesic)—2 percent

Paranat Soil

Positions on landscape: Flood plains
Parent material: Silty alluvium influenced by loess
Slope features: Length—long; shape—smooth
Dominant present vegetation: Basin wildrye, creeping wildrye, inland saltgrass, wiregrass
Typical profile:
0 to 3 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4
3 to 60 inches or more—stratified silt loam to silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6
Depth to water table (artificially lowered): 48 to 72 inches
Hazard of flooding: Frequency—occasional; duration—brief; months—March through June
Permeability: Moderately slow
Available water capacity: 11.0 to 12.5 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—slightly higher parts of the flood plains, alluvial flats adjacent to flood plains; contrasting features—salt- and sodium-affected, light-colored upper layer; distinctive present vegetation—basin wildrye, alkali sacaton, black greasewood
Inclusion 2: Position on landscape—alluvial flat remnants along the margins of the flood plains; contrasting features—well drained, light-colored upper layer; distinctive present vegetation—black greasewood, basin big sagebrush

Major Uses

Irrigated cropland, rangeland, wildlife habitat

Potential Native Plant Community (Table 102)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—fair
Shallow water areas—fair
Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, too crusty
Roadfill: Poor—low strength
Daily cover for landfill: Fair—too clayey
Shallow excavations: Moderate—wetness, flooding
Local roads and streets: Severe—low strength, flooding, frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIw, irrigated, and VIw, nonirrigated
Range site symbol: 025X001N

TABLE 102.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Paranat	1	2
Basin wildrye	ELCI2	15-30	40-60	5-10
Inland saltgrass	DIST	5-10	5-10	---
Creeping wildrye	ELTR3	15-30	---	---
Nevada bluegrass	PONE3	5-10	---	---
Mat muhly	MURI	5-10	---	---
Alkali sacaton	SPAI	---	15-30	---
Indian ricegrass	ORHY	---	---	2-5
Bottlebrush squirreltail	SIHY	---	---	2-5
Other perennial grasses	PPGG	5-15	2-4	2-5
Povertyweed	IVAX	---	1-2	---
Thelypody	THELY	---	---	2-4
Globemallow	SPHAE	---	---	1-2
Other perennial forbs	PPFF	5-10	2-4	1-2
Basin big sagebrush	ARTRT*	2-3	---	10-25
Willow	SALIX	5-10	---	---
Black greasewood	SAVE4	---	5-15	20-30
Rubber rabbitbrush	CHNA2	---	2-5	---
Spiny hopsage	GRSP	---	---	5-15
Other shrubs	SSSS	2-5	2-5	2-10
Range site symbol		025X001N	024X007N	024X022N
Potential production (lb/acre):				
Favorable years		3,000	1,900	800
Normal years		2,500	1,400	600
Unfavorable years		1,800	800	350

731—Ados Variant-Pie Creek Variant-Jesse Camp association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 7,000 to 7,600 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Ados Variant fine sandy loam, 2 to 8 percent slopes (Xerollic Paleorthids - loamy-skeletal, carbonatic, frigid)—40 percent
Pie Creek Variant gravelly fine sandy loam, 2 to 8 percent slopes (Aridic Petrocalcic Palexerolls - loamy-skeletal, carbonatic, frigid)—30 percent
Jesse Camp silt loam, 0 to 2 percent slopes (Xerollic Camborthids - fine-silty, mixed, frigid)—20 percent
Contrasting inclusion as follows:
Inclusion 1: Calciorthidic Haploxerolls, 0 to 8 percent slopes—10 percent

Ados Variant Soil

Positions on landscape: Slightly dissected fan piedmonts
Parent material: Kind—alluvium; source—limestone, calcareous shale
Slope features: Length—short; shape—plane to convex
Dominant present vegetation: Black sagebrush, phlox, Sandberg bluegrass, bottlebrush squirreltail
Typical profile:
0 to 5 inches—fine sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
5 to 23 inches—very gravelly loam, very gravelly sandy loam; 0 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
23 to 37 inches—indurated hardpan
37 to 60 inches or more—stratified gravelly loam to extremely gravelly loamy sand; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive and single grain; hard and loose, friable and loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, SM; estimated AASHTO classification - A-1, A-2
Range in depth to hardpan: 20 to 35 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 1.8 to 3.8 inches
Water supplying capacity: 11 to 13 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.32; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Pie Creek Variant Soil

Positions on landscape: Slightly dissected fan piedmonts
Parent material: Kind—alluvium; source—limestone, dolostone
Slope features: Length—short; shape—concave
Dominant present vegetation: Big sagebrush, western wheatgrass, lupine, phlox, Thurber needlegrass
Typical profile:
0 to 3 inches—gravelly fine sandy loam; 25 to 50 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, GM-GC, SM, SM-SC; estimated AASHTO classification - A-2, A-4
3 to 10 inches—gravelly loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC, GC, SM-SC, SC; estimated AASHTO classification - A-4, A-6
10 to 25 inches—very gravelly loam, very gravelly clay loam; 50 to 65 percent pebbles (by weight); subangular blocky structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-6
25 to 32 inches—indurated hardpan
Range in depth to hardpan: 20 to 26 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 1.4 to 2.5 inches

Water supplying capacity: 9 to 11 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.20; T value—2; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Jesse Camp Soil

Positions on landscape: Inset fans
Parent material: Mixed alluvium influenced by volcanic ash
Slope features: Length—short; shape—convex
Dominant present vegetation: Basin big sagebrush, phlox, rabbitbrush, Thurber needlegrass, western wheatgrass
Typical profile:
0 to 10 inches—silt loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - ML; estimated AASHTO classification - A-4
10 to 60 inches or more—silt loam; massive; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - ML; estimated AASHTO classification - A-4, A-6
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Moderately slow
Available water capacity: 10.4 to 11.1 inches
Water supplying capacity: 8 to 11 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusion

Inclusion 1: Position on landscape—foot slopes of fan piedmonts; contrasting features—dark-colored upper layer, does not have a lime-cemented hardpan; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 103)

Elements of Wildlife Habitat

Suitability of Ados Variant soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Pie Creek Variant soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Jesse Camp soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Ados Variant Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan, small stones
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Moderate—cemented pan, frost action
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Moderate—seepage, piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Pie Creek Variant Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan, small stones
Shallow excavations: Severe—cemented pan
Local roads and streets: Moderate—cemented pan, frost action, shrink-swell
Pond reservoir areas: Moderate—seepage, cemented pan, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Jesse Camp Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Fair—low strength, shrink-swell
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines

TABLE 103.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name			Inclusion number--
		Ados Variant	Pie Creek Variant	Jesse Camp	1
Indian ricegrass	ORHY	15-25	---	---	20-30
Needleandthread	STCO4	5-10	---	---	10-20
Bluebunch wheatgrass	AGSP	2-5	20-30	---	---
Basin wildrye	ELCI2	2-5	---	30-50	---
Thurber needlegrass	STTH2	---	15-25	---	---
Nevada bluegrass	PONE3	---	2-10	2-5	---
Wheatgrass	AGROP2	---	---	2-5	---
Bottlebrush squirreltail	SIHY	---	---	---	5-10
Sandberg bluegrass	POSE	---	---	---	2-5
Other perennial grasses	PPGG	10-20	10-15	15-25	5-10
Perennial forbs	PPFF	5-10	2-5	2-5	2-5
Black sagebrush	ARARN	20-30	---	---	---
Bud sagebrush	ARSP5	2-5	---	---	---
Winterfat	EULA5	5-10	---	---	---
Small rabbitbrush	CHVIS	2-5	---	---	---
Big sagebrush	ARTR2	---	10-15	---	---
Douglas rabbitbrush	CHVI8	---	5-10	---	---
Basin big sagebrush	ARTRT*	---	---	5-10	---
Wyoming big sagebrush	ARTRW*	---	---	1-2	15-20
Other shrubs	SSSS	10-20	---	5-8	5-10
Range site symbol		028B011N	025X014N	028B003N	028B010N
Potential production (lb/acre):					
Favorable years		900	1,000	2,600	800
Normal years		700	800	1,250	600
Unfavorable years		400	600	800	400

Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Ados Variant soil—VIIs, nonirrigated; Pie Creek Variant soil—IIIs, irrigated, and VIs, nonirrigated; Jesse Camp soil—IIc, irrigated, and VIc, nonirrigated

Range site symbol: Ados Variant soil—028B011N; Pie Creek Variant soil—025X014N; Jesse Camp soil—028B003N

741—Creemon-Relley association

Map Unit Setting

Positions on landscape: Fan skirts
Elevation: 4,600 to 5,000 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Creemon silt loam, 2 to 4 percent slopes (Duric Camborthids - coarse-silty, mixed, mesic)—60 percent
Relley silt loam, 0 to 2 percent slopes (Duric Camborthids - fine-silty, mixed, mesic)—30 percent
Contrasting inclusions as follows:
Inclusion 1: Duric Camborthids, strongly alkaline, 0 to 2 percent slopes (Duric Camborthids - coarse-loamy, mixed, mesic)—5 percent
Inclusion 2: Duric Camborthids, 2 to 4 percent slopes (Duric Camborthids - coarse-loamy, mixed, mesic)—5 percent

Creemon Soil

Positions on landscape: Upper part of fan skirts
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, mustard, cheatgrass, black greasewood
Typical profile:
0 to 5 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4
5 to 11 inches—very fine sandy loam, silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - ML; estimated AASHTO classification - A-4
11 to 60 inches or more—stratified very fine sandy loam to silt loam; massive; slightly hard, very friable; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 10.1 to 12.1 inches
Water supplying capacity: 5 to 8 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: Low

Relley Soil

Positions on landscape: Lower part of fan skirts
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, mustard, cheatgrass, black greasewood
Typical profile:
0 to 4 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - CL-ML, ML; estimated AASHTO classification - A-4
4 to 14 inches—silt loam; prismatic structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - CL-ML, ML; estimated AASHTO classification - A-4
14 to 51 inches—stratified very fine sand loam to silty clay loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - CL-ML, ML; estimated AASHTO classification - A-4
51 to 60 inches or more—coarse sandy loam; 5 to 15 percent pebbles (by weight); massive; soft, friable; very strongly alkaline (pH 9.2); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - SM; estimated AASHTO classification - A-1, A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 10.3 to 10.7 inches
Water supplying capacity: 6 to 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate

Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—margins of lower fan skirts bordering alluvial flat remnants; contrasting features—strongly saline- and alkali-affected, sandy loam throughout the profile; distinctive present vegetation—black greasewood, shadscale, seepweed, bottlebrush squirreltail

Inclusion 2: Position on landscape—areas along fan skirt channels; contrasting feature—sandy loam throughout the profile; distinctive present vegetation—shadscale, bud sagebrush, mustard, cheatgrass, black greasewood

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 104)

Elements of Wildlife Habitat

Suitability of Creemon soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor

Suitability of Relley soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Creemon Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too crusty, too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight

TABLE 104.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Creemon	Relley	1	2
Indian ricegrass	ORHY	5-15	5-15	---	5-15
Bottlebrush squirreltail	SIHY	5-10	5-10	7-10	5-10
Bluegrass	POA++	2-5	2-5	---	2-5
Inland saltgrass	DIST	---	---	T-2	---
Basin wildrye	ELCI2	---	---	T-2	---
Globemallow	SPHAE	2-3	2-3	---	2-3
Miterwort	NITRO	---	---	2-3	---
Other perennial forbs	PPFF	2-4	2-4	T-3	2-4
Shadscale	ATCO	30-35	30-35	30-40	30-35
Bud sagebrush	ARSP5	25-30	25-30	5-10	25-30
Black greasewood	SAVE4	---	---	20-30	---
Seepweed	SUAED	---	---	5-15	---
Other shrubs	SSSS	2-5	2-5	---	2-5
Range site symbol		024X002N	024X002N	024X003N	024X002N
Potential production (lb/acre):					
Favorable years		700	700	600	700
Normal years		450	450	450	450
Unfavorable years		300	300	300	300

Local roads and streets: Slight
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—piping, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Relley Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—low strength, shrink-swell
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Creemon soil—IIe, irrigated, and VIIc, nonirrigated; Relley soil—IIc, irrigated, and VIIc, nonirrigated
Range site symbol: 024X002N

762—Shagnasty-Softscrabble association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 6,500 to 8,000 feet
Climatic data (average annual):
Precipitation—about 15 inches
Air temperature—about 44 degrees F
Frost-free season—about 60 days

Composition

Shagnasty extremely stony loam, 15 to 50 percent slopes (Typic Argixerolls - fine, montmorillonitic, frigid)—60 percent
Softscrabble very stony fine sandy loam, 15 to 30 percent slopes (Pachic Argixerolls - loamy-skeletal, mixed, frigid)—25 percent
Contrasting inclusions as follows:
Inclusion 1: Walti extremely stony loam, 8 to 30 percent slopes (Aridic Argixerolls - fine, montmorillonitic, frigid)—6 percent
Inclusion 2: Pachic Argixerolls, 8 to 30 percent slopes—4 percent
Inclusion 3: Welch loam, drained, 2 to 8 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—3 percent
Inclusion 4: Welch loam, 2 to 8 percent slopes (Cumulic Hapaquolls - fine-loamy, mixed, frigid)—2 percent

Shagnasty Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum, colluvium; source—rhyolite, andesite, quartzite
Slope features: Length—short; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, mountain big sagebrush, basin wildrye, snowberry
Typical profile:
0 to 12 inches—extremely stony loam; 40 to 60 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SC, SM-SC; estimated AASHTO classification - A-4, A-6
12 to 36 inches—clay, clay loam; 5 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); prismatic structure; extremely hard, very firm; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
36 to 59 inches—cobbly clay loam, cobbly silty clay loam; 15 to 25 percent cobbles and stones and 15 to 35 percent pebbles (by weight); massive; very hard, firm; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL, CH, MH; estimated AASHTO classification - A-6, A-7
59 inches—weathered bedrock
Range in depth to bedrock: 50 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 6.2 to 8.7 inches
Water supplying capacity: 12 to 15 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—3; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Softscrabble Soil

Positions on landscape: Lower side slopes of mountains
Parent material: Kind—residuum, colluvium; source—volcanic rocks
Slope features: Length—short; shape—concave
Dominant present vegetation: Mountain big sagebrush, basin wildrye, Idaho fescue, snowberry, serviceberry, needlegrass
Typical profile:
0 to 20 inches—very stony fine sandy loam; 25 to 50 percent cobbles and stones and 45 to 65 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
20 to 38 inches—extremely gravelly clay loam, very gravelly clay loam; 10 to 25 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2
38 to 60 inches or more—very gravelly loam, very gravelly clay loam, extremely gravelly loam; 10 to 25 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less

than 2); estimated Unified classification - GC, GM; estimated AASHTO classification - A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 5.7 to 7.0 inches
Water supplying capacity: 14 to 16 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.05; T value—5; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—bedrock at a depth of 20 to 30 inches; distinctive present vegetation—low sagebrush, Sandberg bluegrass, Idaho fescue, bluebunch wheatgrass
Inclusion 2: Position on landscape—concave upper side slopes of mountains; contrasting feature—receives additional moisture from drifted snow; distinctive present vegetation—chokecherry, serviceberry, snowberry, basin wildrye, Idaho fescue
Inclusion 3: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, moderately wet; distinctive present vegetation—basin big sagebrush, basin wildrye, rabbitbrush
Inclusion 4: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, wet; distinctive present vegetation—sedge, willow, tufted hairgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 105)

Woodland

Shagnasty Soil

Site index for common trees: Singleleaf pinyon—55; Utah juniper—55
Most important native understory plants: Bluebunch wheatgrass, Idaho fescue, big sagebrush

Elements of Wildlife Habitat

Suitability of Shagnasty soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Softscrabble soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Shagnasty Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—low strength, slope, shrink-swell
Daily cover for landfill: Poor—too clayey, hard to pack, slope
Shallow excavations: Severe—slope, severe—slope,
Local roads and streets: Severe—slope, low strength, shrink-swell
Ponds reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer, hard to pack, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Softscrabble Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Fair—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—seepage, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site symbol: Softscrabble soil—028B030N
Woodland suitability group: Shagnasty soil—2r

TABLE 105.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Shagnasty	Softscrabble	1	2	3	4
Indian ricegrass	ORHY	X	---	2-5	---	---	---
Needleandthread	STCO4	X	---	---	---	---	---
Pine bluegrass	POSC	X	2-5	5-10	---	---	---
Bluebunch wheatgrass	AGSP	X	10-20	5-10	1-3	---	---
Nevada bluegrass	PONE3	X	---	---	---	5-10	5-10
Thurber needlegrass	STTH2	X	5-10	2-5	---	---	---
Bottlebrush squirreltail	SIHY	X	---	2-5	---	---	---
Sandberg bluegrass	POSE	X	---	---	---	---	---
Basin wildrye	ELC12	---	2-5	---	1-5	30-50	---
Idaho fescue	FEID	---	2-5	2-5	5-10	---	---
Western wheatgrass	AGSM	---	1-5	---	---	5-10	---
Mountain brome	BRMA4	---	---	---	2-5	---	---
Tufted hairgrass	DECA5	---	---	---	---	---	30-60
Sedge	CAREX	---	---	---	---	---	5-10
Alpine timothy	PHAL2	---	---	---	---	---	5-10
Other perennial grasses	PPGG	X	10-20	10-15	5-15	5-15	2-10
Sierra clover	TRWO	---	---	---	---	---	2-5
Cinquefoil	POTEN	---	---	---	---	---	2-5
Other perennial forbs	PPFF	X	5-12	10-15	5-15	5-10	10-20
Big sagebrush	ARTR2	X	---	---	---	---	---
Utah juniper	JUOS	X	---	---	---	---	---
Singleleaf pinyon	PIMO	X	---	---	---	---	---
Serviceberry	AMELA	---	2-10	---	2-5	---	---
Antelope bitterbrush	PURTR2	---	5-10	---	---	---	---
Horsebrush	TETRA3	---	1-2	---	---	---	---
Mountain big sagebrush	ARTRV	---	15-25	---	1-5	1-2	---
Low sagebrush	ARAR8	---	---	25-30	---	---	---
Snowberry	SYMPH	---	---	---	5-10	---	---
Common chokecherry	PRVI	---	---	---	20-30	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	5-10	---
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5	---
Willow	SALIX	---	---	---	---	---	2-5
Other shrubs	SSSS	X	5-15	10-20	10-15	5-10	---

Range site symbol	---	028B030N	028B037N	028B026N	028B024N	025X005N
Woodland site symbol	025X062N	---	---	---	---	---
Potential production (lb/acre):						
Favorable years	500	1,100	700	1,400	2,800	2,000
Normal years	300	800	500	1,000	1,700	1,700
Unfavorable years	250	600	300	700	1,000	1,000

764—Shagnasty-Ravenswood-Rock outcrop association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 6,000 to 8,000 feet
Climatic data (average annual):
Precipitation—about 13 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Shagnasty extremely stony loam, 30 to 50 percent slopes (Typic Argixerolls - fine, montmorillonitic, frigid)—45 percent
Ravenswood extremely stony loam, 30 to 50 percent slopes (Typic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—25 percent
Rock outcrop—15 percent
Contrasting inclusions as follows:
Inclusion 1: Walti extremely stony loam, 8 to 30 percent slopes (Aridic Argixerolls - fine, montmorillonitic, frigid)—8 percent
Inclusion 2: Lithic Argixerolls, 15 to 50 percent slopes—5 percent
Inclusion 3: Welch loam, drained, 0 to 8 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—2 percent

Shagnasty Soil

Positions on landscape: Upper side slopes of mountains
Parent material: Kind—residuum, colluvium; source—rhyolite, andesite, quartzite
Slope features: Length—short; shape—concave
Dominant present vegetation: Singleleaf pinyon, Utah juniper, mountain big sagebrush, basin wildrye, snowberry
Typical profile:
0 to 12 inches—extremely stony loam; 40 to 60 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SC, SM-SC; estimated AASHTO classification - A-4, A-6
12 to 36 inches—clay, clay loam; 5 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); prismatic structure; extremely hard, very firm; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
36 to 59 inches—cobbly clay loam, cobbly silty clay loam; 15 to 25 percent cobbles and stones and 15 to 35 percent pebbles (by weight); massive; very hard, firm; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL, CH, MH; estimated AASHTO classification - A-6, A-7
59 inches—weathered bedrock
Range in depth to bedrock: 50 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 6.2 to 8.7 inches
Water supplying capacity: 12 to 15 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—3; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Ravenswood Soil

Positions on landscape: Lower side slopes of mountains
Parent material: Kind—residuum, colluvium; source—quartzite, andesite, rhyolite
Slope features: Length—short; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, mountain big sagebrush, rabbitbrush
Typical profile:
0 to 8 inches—extremely stony loam; 25 to 40 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC; estimated AASHTO classification - A-2, A-4
8 to 13 inches—very gravelly clay loam; 5 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2
13 to 35 inches—very gravelly clay loam, very gravelly clay; 5 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; very hard, very firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7

35 inches—unweathered bedrock
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 3.7 to 6.0 inches
Water supplying capacity: 12 to 13 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Rock Outcrop

Positions on landscape: Eroded side slopes of mountains
Slope features: Length—short; shape—convex
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1: Position on landscape—convex upper side slopes of mountains; contrasting feature—bedrock at a depth of 20 to 30 inches; distinctive present vegetation—low sagebrush, Idaho fescue, low rabbitbrush
Inclusion 2: Position on landscape—convex lateral crests of mountains; contrasting feature—bedrock at a depth of less than 20 inches; distinctive present vegetation—low sagebrush, bluegrass, low rabbitbrush
Inclusion 3: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, receives additional moisture from runoff, slopes of 0 to 8 percent; distinctive present vegetation—sedge, tufted hairgrass, basin big sagebrush

Major Uses

Rangeland, wildlife habitat, woodland

Potential Native Plant Community (Table 106)

Woodland

Shagnasty Soil

Site index for common trees: Singleleaf pinyon—55; Utah juniper—55
Most important native understory plants: Bluebunch wheatgrass, basin wildrye, mountain big sagebrush

Ravenswood Soil

Site index for common trees: Singleleaf pinyon—50
Most important native understory plants: Bluebunch wheatgrass, basin wildrye, mountain big sagebrush

Elements of Wildlife Habitat

Suitability of Shagnasty soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Ravenswood soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Shagnasty Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—low strength, slope, shrink-swell
Daily cover for landfill: Poor—too clayey, hard to pack, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer, hard to pack, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Ravenswood Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—depth to rock, low strength, slope
Daily cover for landfill: Poor—depth to rock, too clayey, hard to pack
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—low strength, depth to rock, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Shagnasty soil—VIIs, nonirrigated; Ravenswood soil—VIIs, nonirrigated; Rock outcrop—VIIIs
Woodland suitability group: Shagnasty soil—2r; Ravenswood soil—3r

TABLE 106.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Shagnasty	Ravenswood	Rock outcrop	1	2	3
Indian ricegrass	ORHY	X	X	---	---	2-5	2-5
Needleandthread	STCO4	X	X	---	---	---	---
Pine bluegrass	POSC	X	X	---	---	5-10	5-10
Bluebunch wheatgrass	AGSP	X	X	---	---	5-10	5-10
Nevada bluegrass	PONE3	X	X	---	5-10	---	---
Thurber needlegrass	STTH2	X	X	---	---	2-5	2-5
Bottlebrush squirreltail	SIHY	X	X	---	---	2-5	2-5
Sandberg bluegrass	POSE	X	X	---	---	---	---
Basin wildrye	ELCI2	---	---	---	30-50	---	---
Western wheatgrass	AGSM	---	---	---	5-10	---	---
Idaho Fescue	FEID	---	---	---	---	10-15	2-5
Letterman needlegrass	STLE4	---	---	---	---	2-5	---
Other perennial grasses	PPGG	X	X	---	5-15	10-15	10-15
Perennial forbs	PPFF	X	X	---	5-10	5-10	10-15
Big sagebrush	ARTR2	X	X	---	---	---	---
Utah juniper	JUOS	X	X	---	---	---	---
Singleleaf pinyon	PIMO	X	X	---	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	5-10	---	---
Mountain big sagebrush	ARTRV	---	---	---	1-2	---	---
Rubber rabbitbrush	CHNA2	---	---	---	2-5	---	---
Low sagebrush	ARAR8	---	---	---	---	20-35	25-30
Low rabbitbrush	CHVIH2	---	---	---	---	2-5	---
Snowberry	SYMPH	---	---	---	---	2-5	---
Horsebrush	TETRA3	---	---	---	---	2-5	---
Other shrubs	SSSS	X	X	---	5-10	5-10	10-20
Range site symbol		---	---	BARREN	028B024N	028B038N	028B037N
Woodland site symbol		025X062N	025X062N	---	---	---	---
Potential production (lb/acre):							
Favorable years		500	500	---	2,800	800	700
Normal years		300	300	---	1,700	600	500
Unfavorable years		250	250	---	1,000	400	300

770—Welch loam, drained, 0 to 4 percent slopes

Map Unit Setting

Positions on landscape: Inset fans bounded by mountains and fan piedmonts
Elevation: 6,500 to 7,500 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 42 degrees F
Frost-free season—about 90 days

Composition

Welch loam, drained, 0 to 4 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Pachic Argixerolls, 2 to 8 percent slopes—8 percent
Inclusion 2: Fluvaquentic Haploxerolls, 0 to 4 percent slopes—6 percent
Inclusion 3: Welch loam, 0 to 4 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—1 percent

Welch Soil

Positions on landscape: Entrenched inset fans
Parent material: Kind—alluvium; source—volcanic rock
Slope features: Length—short; shape—slightly concave
Dominant present vegetation: Basin big sagebrush, basin wildrye, rabbitbrush, western wheatgrass
Typical profile:
0 to 13 inches—loam; 10 to 25 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - ML; estimated AASHTO classification - A-4
13 to 60 inches or more—stratified very fine sandy loam to gravelly clay loam; 10 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL; estimated AASHTO classification - A-6
Depth to seasonal high water table: In February through May—48 to 60 inches; rest of year—more than 60 inches
Hazard of flooding: Frequency—occasional; duration—very brief to brief; months—March through May
Permeability: Moderately slow
Available water capacity: 10.5 to 12.0 inches
Water supplying capacity: 11 to 13 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.32; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—foot slopes of mountains and lower side slopes of fan piedmont remnants; contrasting features—moderately well drained, layer of clay accumulation; distinctive present vegetation—basin big sagebrush, basin wildrye, rabbitbrush, bluebunch wheatgrass
Inclusion 2: Position on landscape—banks of channels; contrasting feature—frequently flooded; distinctive present vegetation—cottonwood, basin big sagebrush, basin wildrye
Inclusion 3: Position on landscape—smooth inset fans; contrasting features—poorly drained, frequently flooded; distinctive present vegetation—tufted hairgrass, sedge, willow

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 107)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Good
Roadfill: Fair—low strength, shrink-swell
Daily cover for landfill: Fair—too clayey
Shallow excavations: Moderate—flooding, wetness
Local roads and streets: Severe—flooding, frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Moderate—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIIw, irrigated, and VIw, nonirrigated
Range site symbol: 028B024N

TABLE 107.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Welch	1	2	3
Basin wildrye	ELCI2	30-50	5-10	---	30-50
Western wheatgrass	AGSM	5-10	---	---	5-10
Nevada bluegrass	PONE3	5-10	---	5-10	5-10
Slender wheatgrass	AGTR	---	2-5	---	---
Bearded wheatgrass	AGSU	---	1-10	---	---
Nodding brome	BRAN	---	1-10	---	---
Slender hairgrass	DEEL	---	2-5	---	---
Tufted hairgrass	DECA5	---	---	30-60	---
Sedge	CAREX	---	---	5-10	---
Alpine timothy	PHAL2	---	---	5-10	---
Other perennial grasses	PPGG	5-15	5-10	2-10	5-15
Sierra clover	TRWO	---	---	2-5	---
Cinquefoil	POTEN	---	---	2-5	---
Other perennial forbs	PPFF	5-10	10-20	10-20	5-10
Basin big sagebrush	ARTRT*	5-10	1-2	---	5-10
Mountain big sagebrush	ARTRV	1-2	---	---	1-2
Rubber rabbitbrush	CHNA2	2-5	---	---	2-5
Common chokecherry	PRVI	---	5-10	---	---
Woods rose	ROWO	---	5-10	---	---
Snowberry	SYMPH	---	2-5	---	---
Willow	SALIX	---	---	2-5	---
Other shrubs	SSSS	5-10	5-10	---	5-10
Range site symbol		028B024N	028B025N	025X005N	028B024N
Potential production (lb/acre):					
Favorable years		2,800	1,700	2,000	2,800
Normal years		1,700	1,300	1,700	1,700
Unfavorable years		1,000	900	1,000	1,000

771—Welch gravelly silt loam, drained, 2 to 8 percent slopes

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 6,500 to 7,200 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 42 degrees F
Frost-free season—about 90 days

Composition

Welch gravelly silt loam, drained, 2 to 8 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Silverado sandy loam, 2 to 8 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, frigid)—5 percent
Inclusion 2: Poorcal loam, 0 to 4 percent slopes (Durixerollic Calciorthids - coarse-loamy, mixed, frigid)—5 percent
Inclusion 3: Welch loam, drained, 0 to 2 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—5 percent

Welch Soil

Positions on landscape: Entrenched inset fans
Parent material: Kind—alluvium; source—volcanic rock
Slope features: Length—short; shape—smooth
Dominant present vegetation: Pasture grasses, basin wildrye, basin big sagebrush
Typical profile:
0 to 13 inches—gravelly silt loam; 25 to 50 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, ML; estimated AASHTO classification - A-2, A-4
13 to 60 inches or more—stratified very fine sandy loam to gravelly clay loam; 10 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL; estimated AASHTO classification - A-6
Depth to seasonal high water table: In February through May—48 to 60 inches; rest of year—below 60 inches
Hazard of flooding: Frequency—occasional; duration—very brief to brief; months—March through May
Permeability: Moderately slow
Available water capacity: 10.2 to 11.4 inches
Water supplying capacity: 11 to 13 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—5; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth adjacent fan skirts; contrasting features—well drained, layer of weak silica cementation; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass
Inclusion 2: Position on landscape—adjacent remnants of inset fans; contrasting feature—layers of silica and lime accumulation; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass
Inclusion 3: Position on landscape—entrenched lower parts of inset fans; contrasting features—slopes of 0 to 2 percent, loamy upper layer; distinctive present vegetation—pasture grasses, basin wildrye, basin big sagebrush

Major Uses

Rangeland, wildlife habitat, irrigated cropland

Potential Native Plant Community (Table 108)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Good
Roadfill: Fair—low strength, shrink-swell
Daily cover for landfill: Fair—too clayey
Shallow excavations: Moderate—wetness, flooding
Local roads and streets: Severe—flooding, frost action
Pond reservoir areas: Moderate—slope
Embankments, dikes, and levees: Moderate—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 108.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Welch	1	2	3
Basin wildrye	ELCI2	30-50	---	---	30-50
Western wheatgrass	AGSM	5-10	---	---	5-10
Nevada bluegrass	PONE3	5-10	---	---	5-10
Indian ricegrass	ORHY	---	20-30	20-30	---
Needleandthread	STCO4	---	10-20	10-20	---
Bottlebrush squirreltail	SIHY	---	5-10	5-10	---
Sandberg bluegrass	POSE	---	2-5	2-5	---
Other perennial grasses	PPGG	5-15	5-10	5-10	5-15
Perennial forbs	PPFF	5-10	2-5	2-5	5-10
Basin big sagebrush	ARTRT*	5-10	---	---	5-10
Mountain big sagebrush	ARTRV	1-2	---	---	1-2
Rubber rabbitbrush	CHNA2	2-5	---	---	2-5
Wyoming big sagebrush	ARTRW*	---	15-20	15-20	---
Other shrubs	SSSS	5-10	5-10	5-10	5-10
Range site symbol		028B024N	028B010N	028B010N	028B024N
Potential production (lb/acre):					
Favorable years		2,800	800	800	2,800
Normal years		1,700	600	600	1,700
Unfavorable years		1,000	400	400	1,000

Interpretive Groups

Range site symbol: 028B024N

Capability classification: IIIw, irrigated, and VIw, nonirrigated

772—Welch silt loam, 0 to 2 percent slopes

Map Unit Setting

Positions on landscape: Flood plains bounded by mountains and fan piedmonts
Elevation: 5,700 to 6,800 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 42 degrees F
Frost-free season—about 80 days

Composition

Welch silt loam, 0 to 2 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—90 percent
Contrasting inclusion as follows:
Inclusion 1: Welch loam, drained, 0 to 4 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—10 percent

Welch Soil

Positions on landscape: Flood plains
Parent material: Kind—alluvium; source—volcanic rocks
Slope features: Length—short; shape—smooth
Dominant present vegetation: Tufted hairgrass, sedge, willow, bluegrass
Typical profile:
0 to 13 inches—silt loam; 0 to 5 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, CL; estimated AASHTO classification - A-4
13 to 60 inches or more—stratified sandy loam to silty clay loam; 0 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL; estimated AASHTO classification - A-6
Depth to seasonal high water table: In November through June—12 to 18 inches; rest of year—below 18 inches
Hazard of flooding: Frequency—frequent; duration—brief; months—March through June
Permeability: Moderately slow
Available water capacity: 7.8 to 12.2 inches
Water supplying capacity: 14 to 16 inches
Runoff: Very slow
Hydrologic group: D
Erosion factors (upper layer): K value—0.32; T value—5; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: High

Contrasting Inclusion

Inclusion 1: Position on landscape—entrenched flood plains; contrasting feature—seasonal high water table at a depth of 20 to 40 inches; distinctive present vegetation—basin wildrye, basin big sagebrush, bluegrass

Major Uses

Rangeland, wildlife habitat, irrigated cropland

Potential Native Plant Community (Table 109)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—very poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—good
Shallow water areas—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Good
Roadfill: Fair—low strength, wetness, shrink-swell
Daily cover for landfill: Poor—wetness
Shallow excavations: Severe—wetness
Local roads and streets: Severe—flooding, frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—wetness
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Vw, irrigated and nonirrigated
Range site symbol: 025X005N

TABLE 109.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	Inclusion number--
		Welch	1
Nevada bluegrass	PONE3	5-10	5-10
Tufted hairgrass	DECA5	30-60	---
Sedge	CAREX	5-10	---
Alpine timothy	PHAL2	5-10	---
Basin wildrye	ELCI2	---	30-50
Western wheatgrass	AGSM	---	5-10
Other perennial grasses	PPGG	2-10	5-15
Sierra clover	TRWO	2-5	---
Cinquefoil	POTEN	2-5	---
Other perennial forbs	PPFF	10-20	5-10
Willow	SALIX	2-5	---
Basin big sagebrush	ARTRT*	---	5-10
Mountain big sagebrush	ARTRV	---	1-2
Rubber rabbitbrush	CHNA2	---	2-5
Other shrubs	SSSS	---	5-10
Range site symbol		025X005N	028B024N
Potential production (lb/acre):			
Favorable years		2,000	2,800
Normal years		1,700	1,700
Unfavorable years		1,000	1,000

781—Walti-Softscrabble-Chad association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 6,000 to 8,200 feet
Climatic data (average annual):
Precipitation—about 15 inches
Air temperature—about 43 degrees F
Frost-free season—about 70 days

Composition

Walti extremely stony loam, 30 to 50 percent slopes (Aridic Argixerolls - fine, montmorillonitic, frigid)—40 percent
Softscrabble very stony fine sandy loam, 30 to 50 percent slopes (Pachic Argixerolls - loamy-skeletal, mixed, frigid)—25 percent
Chad cobbly loam, 30 to 50 percent slopes (Aridic Argixerolls - fine, mixed, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—8 percent
Inclusion 2: Cleavage very stony loam, 15 to 50 percent slopes (Lithic Argixerolls - loamy-skeletal, mixed, frigid)—7 percent

Walti Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—colluvium, residuum; source—rhyolite, andesite, quartzite
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush, Sandberg bluegrass, Idaho fescue, bluebunch wheatgrass
Typical profile:
0 to 5 inches—extremely stony loam; 25 to 55 percent cobbles and stones and 55 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
5 to 9 inches—clay loam, gravelly clay loam; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL; estimated AASHTO classification - A-6
9 to 22 inches—clay, gravelly clay; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CH, MH; estimated AASHTO classification - A-7
22 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 2.6 to 3.3 inches
Water supplying capacity: 12 to 15 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.10; T value—2; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Softscrabble Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—colluvium, residuum; source—volcanic rocks
Slope features: Length—short; shape—concave
Dominant present vegetation: Mountain big sagebrush, basin wildrye, Idaho fescue, snowberry
Typical profile:
0 to 20 inches—very stony fine sandy loam; 25 to 50 percent cobbles and stones and 45 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
20 to 38 inches—extremely gravelly clay loam, very gravelly clay loam; 10 to 25 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2
38 to 60 inches or more—very gravelly loam, very gravelly clay loam, extremely gravelly loam; 10 to 25 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC, GM; estimated AASHTO classification - A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None

Permeability: Slow
Available water capacity: 5.8 to 7.0 inches
Water supplying capacity: 14 to 16 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.05; T value—5; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Chad Soil

Positions on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum; source—shale influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth to concave
Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, basin wildrye, rabbitbrush
Typical profile:
0 to 17 inches—cobbly loam; 15 to 25 percent cobbles and stones and 25 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
17 to 42 inches—gravelly clay, clay, gravelly clay loam; 0 to 5 percent cobbles and stones and 15 to 45 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL, MH, SM, SC; estimated AASHTO classification - A-7
42 inches—weathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 4.7 to 5.9 inches
Water supplying capacity: 13 to 15 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.28; T value—3; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—low; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests and slightly concave upper side slopes of mountains; contrasting feature—bedrock exposed at the surface; distinctive present vegetation—barren
Inclusion 2: Position on landscape—convex crests and shoulders of mountains; contrasting feature—bedrock at a depth of 14 to 20 inches; distinctive present vegetation—low sagebrush, Idaho fescue

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 110)

Elements of Wildlife Habitat

Suitability of Walti soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Softscrabble soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Chad soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Walti Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—depth to rock, low strength, slope
Daily cover for landfill: Poor—depth to rock, too clayey, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—low strength, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Softscrabble Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—seepage, small stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Chad Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily

TABLE 110.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Walti	Softscrabble	Chad	1	2
Indian ricegrass	ORHY	2-5	---	---	---	2-5
Pine bluegrass	POSC	5-10	2-5	---	---	5-10
Thurber needlegrass	STTH2	2-5	5-10	5-10	---	2-5
Idaho fescue	FEID	2-5	2-5	---	---	10-15
Bottlebrush squirreltail	SIHY	2-5	---	---	---	2-5
Bluebunch wheatgrass	AGSP	5-10	10-20	10-15	---	5-10
Basin wildrye	ELCI2	---	2-5	5-10	---	---
Western wheatgrass	AGSM	---	1-5	1-4	---	---
Sandberg bluegrass	POSE	---	---	2-5	---	---
Letterman needlegrass	STLE4	---	---	---	---	2-5
Other perennial grasses	PPGG	10-15	10-20	10-15	---	10-15
Perennial forbs	PPFF	10-15	5-12	5-15	---	5-10
Low sagebrush	ARAR8	25-30	---	---	---	20-35
Serviceberry	AMELA	---	2-10	3-10	---	---
Antelope bitterbrush	PUTR2	---	5-10	2-8	---	---
Horsebrush	TETRA3	---	1-2	---	---	2-5
Mountain big sagebrush	ARTRV	---	15-25	15-25	---	---
Low rabbitbrush	CHVIH2	---	---	---	---	2-5
Snowberry	SYMPH	---	---	---	---	2-5
Other shrubs	SSSS	10-20	5-15	15-20	---	5-10
Range site symbol		028B037N	028B030N	028B027N	BARREN	028B038N
Potential production (lb/acre):						
Favorable years		700	1,100	900	---	800
Normal years		500	800	600	---	600
Unfavorable years		300	600	300	---	400

Roadfill: Poor—slope, shrink-swell
Daily cover for landfill: Poor—too clayey, hard to pack, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—piping, hard to pack
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Walti soil—VIIs, nonirrigated; Softscrabble soil—VIIs, nonirrigated; Chad soil—VIIe, nonirrigated
Range site symbol: Walti soil—028B037N; Softscrabble soil—028B030N; Chad soil—028B027N

782—Walti-Softscrabble-Robson association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 6,000 to 7,500 feet
Climatic data (average annual):
Precipitation—about 15 inches
Air temperature—about 43 degrees F
Frost-free season—about 70 days

Composition

Walti extremely stony loam, 15 to 30 percent slopes (Aridic Argixerolls - fine, montmorillonitic, frigid)—50 percent
Softscrabble very stony fine sandy loam, 15 to 30 percent slopes (Pachic Argixerolls - loamy-skeletal, mixed, frigid)—20 percent
Robson very stony loam, 8 to 15 percent slopes (Lithic Xerollic Haplargids - clayey-skeletal, montmorillonitic, frigid)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Welch loam, drained, 2 to 8 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—5 percent
Inclusion 2: Cleavage very stony loam, 8 to 30 percent slopes (Lithic Argixerolls - loamy-skeletal, mixed, frigid)—5 percent
Inclusion 3: Rock outcrop—5 percent

Walti Soil

Positions on landscape: Middle and upper side slopes of mountains
Parent material: Kind—colluvium, residuum; source—rhyolite, andesite, quartzite
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush, Sandberg bluegrass, Idaho fescue, Thurber needlegrass
Typical profile:
0 to 5 inches—extremely stony loam; 25 to 55 percent cobbles and stones and 55 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
5 to 9 inches—clay loam, gravelly clay loam; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL; estimated AASHTO classification - A-6
9 to 22 inches—clay, gravelly clay; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - MH, CH; estimated AASHTO classification - A-7
22 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 2.7 to 3.3 inches
Water supplying capacity: 12 to 15 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.10; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Softscrabble Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—colluvium, residuum; source—volcanic rock
Slope features: Length—short; shape—concave
Dominant present vegetation: Mountain big sagebrush, basin wildrye, Idaho fescue, serviceberry
Typical profile:
0 to 20 inches—very stony fine sandy loam; 25 to 50 percent cobbles and stones and 45 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
20 to 38 inches—extremely gravelly clay loam, very gravelly clay loam; 10 to 25 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2
38 to 60 inches or more—very gravelly loam, very gravelly clay loam, extremely gravelly loam; 10 to 25 percent cobbles and stones and 45 to 70 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less

than 2); estimated Unified classification - GC, GM; estimated AASHTO classification - A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 5.8 to 7.0 inches
Water supplying capacity: 14 to 16 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.05; T value—5; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Robson Soil

Positions on landscape: Lower side slopes of mountains
Parent material: Kind—residuum; source—rhyolite, andesite, tuff
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush, Sandberg bluegrass, Thurber needlegrass, small rabbitbrush
Typical profile:
0 to 10 inches—very stony loam; 15 to 30 percent cobbles and stones and 10 to 35 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML, CL, SM-SC, SC; estimated AASHTO classification - A-4, A-6
10 to 14 inches—very cobbly clay loam; 30 to 45 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-7
14 to 19 inches—very cobbly clay, extremely cobbly clay; 50 to 80 percent cobbles and stones and 35 to 50 percent pebbles (by weight); prismatic structure; very hard, very firm; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-7
19 inches—unweathered bedrock
Range in depth to bedrock: 12 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 1.8 to 2.5 inches
Water supplying capacity: 10 to 11 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—1; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—slopes of 2 to 8 percent, receives additional moisture from runoff; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 2: Position on landscape—convex crests and upper side slopes of mountains; contrasting features—bedrock at a depth of 14 to 20 inches, dark-colored in the upper 7 to 10 inches, loamy in middle layer; distinctive present vegetation—low sagebrush, black sagebrush, Idaho fescue
Inclusion 3: Position on landscape—convex crests of mountains; contrasting feature—bedrock exposed at the surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 111)

Elements of Wildlife Habitat

Suitability of Walti soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Softscrabble soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Robson soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Walti Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—depth to rock, low strength, slope
Daily cover for landfill: Poor—depth to rock, too clayey, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—low strength, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

TABLE 111.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Walti	Softscrabble	Robson	1	2	3
Indian ricegrass	ORHY	2-5	---	5-10	---	2-5	---
Pine bluegrass	POSC	5-10	2-5	---	---	5-10	---
Thurber needlegrass	STTH2	2-5	5-10	5-10	---	2-5	---
Idaho fescue	FEID	2-5	2-5	---	---	10-15	---
Bottlebrush squirreltail	SIHY	2-5	---	2-5	---	2-5	---
Bluebunch wheatgrass	AGSP	5-10	10-20	2-5	---	5-10	---
Basin wildrye	ELCI2	---	2-5	---	30-50	---	---
Western wheatgrass	AGSM	---	1-5	---	5-10	---	---
Sandberg bluegrass	POSE	---	---	5-10	---	---	---
Nevada bluegrass	PONE3	---	---	---	5-10	---	---
Letterman needlegrass	STLE4	---	---	---	---	2-5	---
Other perennial grasses	PPGG	10-15	10-20	5-10	5-15	10-15	---
Perennial forbs	PPFF	10-15	5-12	5-10	5-10	5-10	---
Annual forbs	AAFF	---	---	1-2	---	---	---
Low sagebrush	ARAR8	25-30	---	25-30	---	20-35	---
Serviceberry	AMELA	---	2-10	---	---	---	---
Antelope bitterbrush	PUTR2	---	5-10	---	---	---	---
Horsebrush	TETRA3	---	1-2	---	---	2-5	---
Mountain big sagebrush	ARTRV	---	15-25	---	1-2	---	---
Basin big sagebrush	ARTRT*	---	---	---	5-10	---	---
Rubber rabbitbrush	CHNA2	---	---	---	2-5	---	---
Low rabbitbrush	CHVIH2	---	---	---	---	2-5	---
Snowberry	SYMPH	---	---	---	---	2-5	---
Other shrubs	SSSS	10-20	5-15	10-15	5-10	5-10	---

Range site symbol	028B037N	028B030N	028B045N	028B024N	028B038N	BARREN
Potential production (lb/acre):						
Favorable years	700	1,100	800	2,800	800	---
Normal years	500	800	600	1,700	600	---
Unfavorable years	300	600	400	1,000	400	---

Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Softscrabble Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—low strength, large stones, slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—seepage, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Robson Soil

Suitability and limitations for the following uses:

Rangeland seeding: Poor—droughty
Roadfill: Poor—depth to rock, large stones
Daily cover for landfill: Poor—depth to rock, large stones
Shallow excavations: Severe—depth to rock, large stones
Local roads and streets: Severe—depth to rock, large stones
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site symbol: Walti soil—028B037N; Softscrabble soil—028B030N; Robson soil—028B045N

783—Walti-Glean association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 7,500 to 8,200 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 44 degrees F
Frost-free season—about 70 days

Composition

Walti extremely stony loam, 8 to 30 percent slopes (Aridic Argixerolls - fine, montmorillonitic, frigid)—70 percent
Glean very stony loam, 15 to 30 percent slopes (Pachic Haploxerolls - loamy-skeletal, mixed, frigid)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Lithic Argixerolls, 15 to 30 percent slopes—8 percent
Inclusion 2: Rock outcrop—4 percent
Inclusion 3: Lithic Haploxerolls, 15 to 30 percent slopes—3 percent

Walti Soil

Positions on landscape: Crests and side slopes of mountains
Parent material: Kind—colluvium, residuum; source—rhyolite, andesite, tuff
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Low sagebrush, Idaho fescue, bluebunch wheatgrass, Sandberg bluegrass
Typical profile:
0 to 5 inches—extremely stony loam; 25 to 55 percent cobbles and stones and 55 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2
5 to 9 inches—clay loam, gravelly clay loam; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL; estimated AASHTO classification - A-6
9 to 22 inches—gravelly clay, clay; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); angular blocky structure; hard, firm; very strongly acid (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - MH, CH; estimated AASHTO classification - A-7
22 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 2.7 to 3.3 inches
Water supplying capacity: 12 to 15 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.10; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Glean Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—colluvium, residuum; source—volcanic rocks, chert, shale
Slope features: Length—short; shape—concave
Dominant present vegetation: Mountain big sagebrush, snowberry, Idaho fescue, bluebunch wheatgrass
Typical profile:
0 to 14 inches—very stony loam; 20 to 35 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM, SM; estimated AASHTO classification - A-2
14 to 56 inches—very gravelly loam, very gravelly sandy loam; 10 to 25 percent cobbles and stones and 40 to 75 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
56 inches—unweathered bedrock
Range in depth to bedrock: 50 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately rapid
Available water capacity: 3.5 to 5.7 inches
Water supplying capacity: 11 to 15 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.15; T value—3; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight

Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests of mountains; contrasting feature—bedrock at a depth of less than 20 inches; distinctive present vegetation—low sagebrush, Idaho fescue, bluebunch wheatgrass
Inclusion 2: Position on landscape—convex crests of mountains; contrasting feature—bedrock exposed at the surface; distinctive present vegetation—barren
Inclusion 3: Position on landscape—convex crests of mountains near rock outcrops; contrasting feature—bedrock at a depth of less than 20 inches; distinctive present vegetation—curlleaf mountainmahogany, snowberry, Idaho fescue

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 112)

Elements of Wildlife Habitat

Suitability of Walti soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Glean soil for named elements:
Wild herbaceous plants (nonirrigated)—good
Shrubs (nonirrigated)—good

Ratings for Selected Uses

Walti Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—depth to rock, low strength, slope
Daily cover for landfill: Poor—depth to rock, too clayey, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—low strength, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Glean Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones
Roadfill: Fair—depth to rock, thin layer, slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope, seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site symbol: Walti soil—028B037N; Glean soil—028B030N

TABLE 112.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Walti	Glean	1	2	3
Indian ricegrass	ORHY	2-5	---	---	---	2-5
Pine bluegrass	POSC	5-10	2-5	2-5	---	5-10
Thurber needlegrass	STTH2	2-5	5-10	2-5	---	2-5
Idaho fescue	FEID	2-5	2-5	5-15	---	2-5
Bottlebrush squirreltail	SIHY	2-5	---	---	---	2-5
Bluebunch wheatgrass	AGSP	5-10	10-20	5-10	---	5-10
Basin wildrye	ELCI2	---	2-5	---	---	---
Western wheatgrass	AGSM	---	1-5	---	---	---
Columbia needlegrass	STCO3	---	---	5-10	---	---
Western needlegrass	STOC2	---	---	5-10	---	---
Letterman needlegrass	STLE4	---	---	2-5	---	---
Other perennial grasses	PPGG	10-15	10-20	5-10	---	10-15
Perennial forbs	PPFF	10-15	5-12	10-15	---	10-15
Low sagebrush	ARAR8	25-30	---	---	---	25-30
Serviceberry	AMELA	---	2-10	---	---	---
Antelope bitterbrush	PUTR2	---	5-10	---	---	---
Horsebrush	TETRA3	---	1-2	---	---	---
Mountain big sagebrush	ARTRV	---	15-25	5-10	---	---
Mountainmahogany	CERCO	---	---	5-10	---	---
Snowberry	SYMPH	---	---	1-5	---	---
Other shrubs	SSSS	10-20	5-15	5-10	---	10-20
Range site symbol		028B037N	028B030N	028B043N	BARREN	028B037N
Potential production (lb/acre):						
Favorable years		700	1,100	1,000	---	700
Normal years		500	800	800	---	500
Unfavorable years		300	600	600	---	300

801—Freznik-Quarz-Jivas association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 6,400 to 7,100 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 43 degrees F
Frost-free season—about 85 days

Composition

Freznik stony clay loam, 15 to 30 percent slopes (Xerollic Paleargids - fine, montmorillonitic, frigid)—35 percent
Quarz cobbly loam, 15 to 30 percent slopes (Aridic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—35 percent
Jivas gravelly loam, 15 to 30 percent slopes (Aridic Argixerolls - loamy-skeletal, mixed, frigid)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Chen cobbly loam, 15 to 30 percent slopes (Lithic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—5 percent
Inclusion 2: Rock outcrop—5 percent
Inclusion 3: Quarz cobbly loam, 30 to 50 percent slopes (Aridic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—3 percent
Inclusion 4: Welch loam, drained, 2 to 8 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—2 percent

Freznik Soil

Positions on landscape: South- and east-facing side slopes of mountains
Parent material: Kind—residuum; source—tuff
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, antelope bitterbrush, rabbitbrush, bluegrass
Typical profile:
0 to 3 inches—stony clay loam; 10 to 25 percent cobbles and stones and 15 to 40 percent pebbles (by weight); granular structure; hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, CL; estimated AASHTO classification - A-6
3 to 21 inches—gravelly clay; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); prismatic structure; very hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, CH; estimated AASHTO classification - A-7
21 to 36 inches—gravelly clay; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, CH; estimated AASHTO classification - A-7
36 inches—unweathered bedrock
Range in depth to bedrock: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 3.7 to 4.7 inches
Water supplying capacity: 9 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.28; T value—2; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Quarz Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—sandstone, shale, quartzite
Slope features: Length—long; shape—concave
Dominant present vegetation: Big sagebrush, antelope bitterbrush, bluebunch wheatgrass
Typical profile:
0 to 5 inches—cobbly loam; 25 to 30 percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.1); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL; estimated AASHTO classification - A-6
5 to 30 inches—very gravelly clay, very gravelly clay loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
30 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 2.7 to 3.2 inches
Water supplying capacity: 11 to 13 inches

Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.20; T value—2; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Jivas Soil

Positions on landscape: South-, east-, and west-facing side slopes of mountains
Parent material: Kind—colluvium, residuum; source—mixed igneous rocks
Slope features: Length—long; shape—concave
Dominant present vegetation: Big sagebrush, rabbitbrush, bluegrass, bluebunch wheatgrass
Typical profile:
0 to 12 inches—gravelly loam; 25 to 50 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, CL-ML; estimated AASHTO classification - A-4
12 to 45 inches—extremely gravelly sandy clay loam, extremely gravelly loam; 0 to 10 percent cobbles and stones and 70 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GP-GC; estimated AASHTO classification - A-2
45 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 3.3 to 4.2 inches
Water supplying capacity: 12 to 13 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—3; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—crests of mountains; contrasting feature—bedrock at a depth of less than 20 inches; distinctive present vegetation—low sagebrush, Idaho fescue
Inclusion 2: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren
Inclusion 3: Position on landscape—concave side slopes of mountains; contrasting feature—slopes of 30 to 50 percent; distinctive present vegetation—big sagebrush, antelope bitterbrush, bluebunch wheatgrass
Inclusion 4: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, moderately wet, slopes of 2 to 8 percent; distinctive present vegetation—basin wildrye, basin big sagebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 113)

Elements of Wildlife Habitat

Suitability of Freznik soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Quarz soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Jivas soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Freznik Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—rooting depth
Roadfill: Poor—depth to rock, low strength
Daily cover for landfill: Poor—depth to rock, hard to pack, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer, hard to pack
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Quarz Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope

TABLE 113.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Freznik	Quarz	Jivas	1	2	3	4
Bluebunch wheatgrass	AGSP	15-40	30-50	30-50	15-30	---	30-50	---
Thurber needlegrass	STTH2	15-40	2-10	2-10	2-10	---	2-10	---
Webber ricegrass	ORWE	5-15	---	---	---	---	---	---
Pine bluegrass	POSC	2-10	---	---	---	---	---	---
Sandberg bluegrass	POSE	2-10	---	---	---	---	---	---
Bottlebrush squirreltail	SIHY	2-5	---	---	2-5	---	---	---
Basin wildrye	ELCI2	1-5	5-10	5-10	---	---	5-10	50-60
Idaho fescue	FEID	2-5	2-5	2-5	30-50	---	2-5	---
Nevada bluegrass	PONE3	---	2-5	2-5	---	---	2-5	5-10
Sedge	CAREX	---	---	---	---	---	---	1-5
Mat muhly	MURI	---	---	---	---	---	---	2-5
Other perennial grasses	PPGG	---	5-10	5-10	2-10	---	5-10	15-20
Lupine	LUPIN	---	2-5	2-5	---	---	2-5	2-5
Arrowleaf balsamroot	BASA3	---	2-5	2-5	---	---	2-5	---
Balsamroot	BALSA	---	---	---	2-5	---	---	---
Other perennial forbs	PPFF	5-10	2-5	2-5	5-15	---	2-5	5-10
Antelope bitterbrush	PUTR2	T-5	2-5	2-5	T-5	---	2-5	---
Douglas rabbitbrush	CHVI8	2-5	---	---	---	---	---	---
Low sagebrush	ARAR8	15-25	---	---	10-25	---	---	---
Mountain big sagebrush	ARTRV	---	5-10	5-10	---	---	5-10	---
Basin big sagebrush	ARTRT*	---	---	---	---	---	---	10-15
Rubber rabbitbrush	CHNA2	---	---	---	---	---	---	2-5
Other shrubs	SSSS	---	2-10	2-10	5-10	---	2-10	---
Range site symbol		025X018N	025X009N	025X009N	025X017N	BARREN	025X009N	025X003N
Potential production (lb/acre):								
Favorable years		800	1,300	1,300	1,000	---	1,300	2,500
Normal years		600	900	900	700	---	900	1,900
Unfavorable years		400	700	700	400	---	00	1,200

Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Jivas Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty, erodes easily
Roadfill: Fair—depth to rock, thin layer, slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Freznik soil—VIIs, nonirrigated; Quarz soil—VIIe, nonirrigated; Jivas soil—VIIe, nonirrigated

Range site symbol: Freznik soil—025X018N; Quarz soil—025X009N; Jivas soil—025X009N

802—Freznik-Whitepeak association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 6,400 to 7,100 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Freznik very stony clay loam, 15 to 30 percent slopes (Xerollic Paleargids - fine, montmorillonitic, frigid)—40 percent
Whitepeak very stony loam, 15 to 30 percent slopes (Xerollic Haplargids - clayey-skeletal, montmorillonitic, frigid)—25 percent
Whitepeak very stony loam, 8 to 15 percent slopes (Xerollic Haplargids - clayey-skeletal, montmorillonitic, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—5 percent
Inclusion 2: Torriorthentic Haploxerolls, 2 to 8 percent slopes (Torriorthentic Haploxerolls - loamy-skeletal, mixed, frigid)—5 percent
Inclusion 3: Aridic Argixerolls, 8 to 30 percent slopes (Aridic Argixerolls - loamy-skeletal, mixed, frigid)—5 percent

Freznik Soil

Positions on landscape: Middle and lower side slopes of mountains
Parent material: Kind—residuum; source—tuff
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Low sagebrush, serviceberry, lupine, bluegrass, bottlebrush squirreltail, cheatgrass
Typical profile:
0 to 3 inches—very stony clay loam; 25 to 55 percent cobbles and stones and 30 to 45 percent pebbles (by weight); granular structure; hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, CL; estimated AASHTO classification - A-6
3 to 21 inches—gravelly clay; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); prismatic structure; very hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, CH; estimated AASHTO classification - A-7
21 to 36 inches—gravelly clay; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, CH; estimated AASHTO classification - A-7
36 inches—unweathered bedrock
Range in depth to bedrock: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 3.5 to 4.6 inches
Water supplying capacity: 9 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—2; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Whitepeak, Moderately Steep, Soil

Positions on landscape: Upper side slopes of mountains
Parent material: Kind—residuum, colluvium; source—quartzite, andesite, rhyolite
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, lupine, phlox, bluegrass, bottlebrush squirreltail, cheatgrass
Typical profile:
0 to 3 inches—very stony loam; 15 to 30 percent cobbles and stones and 20 to 40 percent pebbles (by weight); platy structure; hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, SC; estimated AASHTO classification - A-4, A-6
3 to 23 inches—extremely stony clay, very cobbly clay; 50 to 75 percent cobbles and stones and 35 to 65 percent pebbles (by weight); prismatic structure; very hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, CH; estimated AASHTO classification - A-7, A-2
23 inches—unweathered bedrock
Range in depth to bedrock: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 1.1 to 1.7 inches

Water supplying capacity: 9 to 10 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.17; T value—2; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Whitepeak, Strongly Sloping, Soil

Positions on landscape: Crests of mountains
Parent material: Kind—residuum; source—quartzite, andesite, rhyolite
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush, lupine, phlox, bluegrass, bottlebrush squirreltail, cheatgrass
Typical profile:
0 to 3 inches—very stony loam; 15 to 30 percent cobbles and stones and 20 to 40 percent pebbles (by weight); platy structure; hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, SC; estimated AASHTO classification - A-4, A-6
3 to 23 inches—extremely stony clay, very cobbly clay; 50 to 75 percent cobbles and stones and 35 to 65 percent pebbles (by weight); prismatic structure; very hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, CH; estimated AASHTO classification - A-7, A-2
23 inches—unweathered bedrock
Range in depth to bedrock: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 1.1 to 1.7 inches
Water supplying capacity: 9 to 10 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.17; T value—2; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at the surface; distinctive present vegetation—barren
Inclusion 2: Position on landscape—narrow drainageways of mountains; contrasting features—dark-colored upper layer, slopes of 2 to 8 percent, loamy throughout the profile; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 3: Position on landscape—concave side slopes of mountains; contrasting features—very deep, loamy throughout the profile; distinctive present vegetation—big sagebrush, bluebunch wheatgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 114)

Elements of Wildlife Habitat

Suitability of Freznik soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Whitepeak, moderately steep, soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Whitepeak, strongly sloping, soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Freznik Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—rooting depth, small stones
Roadfill: Poor—depth to rock, low strength
Daily cover for landfill: Poor—depth to rock, hard to pack, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer, hard to pack
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Whitepeak, Moderately Steep, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, rooting depth, large stones
Roadfill: Poor—depth to rock, large stones
Daily cover for landfill: Poor—depth to rock, too clayey, hard to pack
Shallow excavations: Severe—depth to rock, large stones, slope
Local roads and streets: Severe—slope, large stones

TABLE 114.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Freznik	Whitepeak, moderately steep	Whitepeak, strongly sloping	1	2	3
Bluebunch wheatgrass	AGSP	15-40	15-40	15-40	---	---	20-30
Thurber needlegrass	STTH2	15-40	15-40	15-40	---	---	15-25
Webber ricegrass	ORWE	5-15	5-15	5-15	---	---	---
Pine bluegrass	POSC	2-10	2-10	2-10	---	---	---
Sandberg bluegrass	POSE	2-10	2-10	2-10	---	---	---
Bottlebrush squirreltail	SIHY	2-5	2-5	2-5	---	---	---
Basin wildrye	ELCI2	1-5	1-5	1-5	---	50-60	---
Idaho fescue	FEID	2-5	2-5	2-5	---	---	---
Nevada bluegrass	PONE3	---	---	---	---	5-10	2-10
Sedge	CAREX	---	---	---	---	1-5	---
Mat muhly	MURI	---	---	---	---	2-5	---
Other perennial grasses	PPGG	---	---	---	---	15-20	10-15
Lupine	LUPIN	---	---	---	---	2-5	---
Other perennial forbs	PPFF	5-10	5-10	5-10	---	5-10	2-5
Antelope bitterbrush	PUTR2	T-5	T-5	T-5	---	---	---
Douglas rabbitbrush	CHVI8	2-5	2-5	2-5	---	---	5-10
Low sagebrush	ARAR8	15-25	15-25	15-25	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	10-15	---
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5	---
Big sagebrush	ARTR2	---	---	---	---	---	10-15
Range site symbol		025X018N	025X018N	025X018N	BARREN	025X003N	025X014N
Potential production (lb/acre):							
Favorable years		800	800	800	---	2,500	1,000
Normal years		600	600	600	---	1,900	800
Unfavorable years		400	400	400	---	1,200	600

Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Whitepeak, Strongly Sloping, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, rooting depth, large stones
Roadfill: Poor—depth to rock, large stones
Daily cover for landfill: Poor—depth to rock, too clayey, hard to pack
Shallow excavations: Severe—depth to rock, large stones, slope
Local roads and streets: Severe—large stones
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Interpretive Groups

Capability classification: VIIs, nonirrigated

Range site symbol: 025X018N

811—Quarz-Highams-Atrypa Variant association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 5,900 to 7,000 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 85 days

Composition

Quarz very gravelly loam, 15 to 50 percent slopes (Aridic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—40 percent
Highams very gravelly loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents - loamy-skeletal, carbonatic, frigid)—30 percent
Atrypa Variant gravelly loam, 15 to 50 percent slopes (Aridic Haploxerolls - fine-loamy, mixed, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—5 percent
Inclusion 2: Argic Lithic Cryoborolls, 15 to 50 percent slopes (Argic Lithic Cryoborolls - loamy-skeletal, mixed)—5 percent

Quarz Soil

Positions on landscape: South- and west-facing side slopes of mountains
Parent material: Kind—residuum; source—sandstone, shale, quartzite
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Big sagebrush, antelope bitterbrush, rabbitbrush, bluegrass, bluebunch wheatgrass
Typical profile:
0 to 5 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
5 to 30 inches—very gravelly clay loam, very gravelly clay; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
30 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 2.5 to 3.1 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Highams Soil

Positions on landscape: North- and east-facing side slopes of mountains
Parent material: Kind—residuum; source—dolostone, limestone
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, black sagebrush, bottlebrush squirreltail
Typical profile:
0 to 5 inches—very gravelly loam; 50 to 60 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2
5 to 13 inches—very gravelly loam, very cobbly loam; 0 to 40 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2, A-4, A-6
13 inches—unweathered bedrock
Range in depth to bedrock: 10 to 17 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 1.0 to 1.3 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.15; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low

Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Atrypa Variant Soil

Positions on landscape: Crests and side slopes of mountains
Parent material: Kind—residuum; source—interbedded limestone, dolomite, shale, tuff, and sandstone
Slope features: Length—short; shape—convex
Dominant present vegetation: Utah juniper, big sagebrush, rabbitbrush, antelope bitterbrush, phlox, grasses
Typical profile:
0 to 16 inches—gravelly loam; 40 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2, A-4, A-6
16 to 21 inches—gravelly loam; 40 to 50 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2, A-4, A-6
21 inches—weathered bedrock
Range in depth to bedrock: 20 to 27 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 2.3 to 2.7 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.17; T value—2; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at the surface; distinctive present vegetation—barren
Inclusion 2: Position on landscape—eroded windswept side slopes of mountains; contrasting features—shallow to bedrock, layer of clay accumulation, cooler summer soil temperature; distinctive present vegetation—antelope bitterbrush, Idaho fescue, bluebunch wheatgrass

Major Uses

Rangeland, wildlife habitat, woodland

Potential Native Plant Community (Table 115)

Woodland

Highams Soil

Site index for common trees: Singleleaf pinyon—30; Utah juniper—30
Most important native understory plants: Bluebunch wheatgrass, Thurber needlegrass, Indian ricegrass, black sagebrush

Atrypa Variant Soil

Site index for common trees: Utah juniper—30
Most important native understory plants: Bluebunch wheatgrass, Thurber needlegrass, Indian ricegrass, big sagebrush

Elements of Wildlife Habitat

Suitability of Quarz soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Highams soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—poor
Suitability of Atrypa Variant soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Quarz Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Highams Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope

TABLE 115.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Quarz	Highams	Atrypa Variant	1	2
Bluebunch wheatgrass	AGSP	30-50	X	X	---	15-30
Basin wildrye	ELCI2	5-10	---	X	---	5-10
Idaho fescue	FEID	2-5	---	---	---	15-40
Nevada bluegrass	PONE3	2-5	---	---	---	2-5
Thurber needlegrass	STTH2	2-10	X	X	---	T-10
Indian ricegrass	ORHY	---	X	X	---	---
Pine bluegrass	POSC	---	X	---	---	---
Bottlebrush squirreltail	SIHY	---	X	---	---	---
Sandberg bluegrass	POSE	---	X	---	---	---
Black sagebrush	ARARN	---	X	---	---	---
Needleandthread	STCO4	---	---	X	---	---
Bluegrass	POA++	---	---	X	---	---
Other perennial grasses	PPGG	5-10	X	X	---	5-10
Lupine	LUPIN	2-5	---	---	---	---
Arrowleaf balsamroot	BASA3	2-5	---	---	---	5-10
Tapertip hawksbeard	CRAC2	---	---	X	---	---
Hawksbeard	CREPI	---	---	---	---	1-5
Other perennial forbs	PPFF	2-5	X	X	---	5-15
Antelope bitterbrush	PUTR2	2-5	---	---	---	5-15
Mountain big sagebrush	ARTRV	5-10	---	---	---	10-15
Utah juniper	JUOS	---	X	X	---	---
Singleleaf pinyon	PIMO	---	X	---	---	---
Wyoming big sagebrush	ARTRW*	---	---	X	---	---
Rabbitbrush	CHRYS9	---	---	X	---	---
Other shrubs	SSSS	2-10	X	X	---	5-15
Range site symbol		025X009N	---	---	BARREN	025X012N
Woodland site symbol		---	025X063N	025X059N	---	---
Potential production (lb/acre):						
Favorable years		1,300	400	200	---	1,200
Normal years		900	300	150	---	900
Unfavorable years		700	200	100	---	600

Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Atrypa Variant Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope

Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Quarz soil—VIIs, nonirrigated; Highams soil—VIIs, nonirrigated; Atrypa Variant soil—VIIe, nonirrigated
Range site symbol: Quarz soil—025X009N
Woodland suitability group: Highams soil—3r; Atrypa Variant soil—3r

812—Quarz-Bregar-Duff association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 6,300 to 7,500 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 43 degrees F
Frost-free season—about 80 days

Composition

Quarz very gravelly loam, 15 to 50 percent slopes (Aridic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—50 percent
Bregar very gravelly loam, 30 to 50 percent slopes (Lithic Xerollic Haplargids - loamy-skeletal, mixed, frigid)—20 percent
Duff gravelly loam, 30 to 50 percent slopes (Pachic Cryoborolls - fine-loamy, mixed)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—5 percent
Inclusion 2: Fluvaquentic Haplaquolls, drained, 8 to 15 percent slopes—5 percent

Quarz Soil

Positions on landscape: South-, east-, and west-facing side slopes of mountains
Parent material: Kind—residuum; source—sandstone, shale, quartzite, quartz latite
Slope features: Length—long; shape—convex
Dominant present vegetation: Big sagebrush, antelope bitterbrush, bluebunch wheatgrass
Typical profile:
0 to 5 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
5 to 30 inches—very gravelly clay loam, very gravelly clay; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
30 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 2.5 to 3.1 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Bregar Soil

Positions on landscape: Crests and side slopes of mountains
Parent material: Kind—residuum; source—andesite, rhyolite, quartzite
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, bluegrass, Thurber needlegrass, antelope bitterbrush
Typical profile:
0 to 6 inches—very gravelly loam; 10 to 20 percent cobbles and stones and 45 to 60 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2, A-4, A-6
6 to 11 inches—very gravelly sandy clay loam, extremely cobbly clay loam, very gravelly clay loam; 5 to 45 percent cobbles and stones and 65 to 75 percent pebbles (by weight); subangular blocky structure; hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
11 inches—unweathered bedrock
Range in depth to bedrock: 8 to 12 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 0.8 to 1.1 inches
Water supplying capacity: 9 to 10 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.17; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Duff Soil

Positions on landscape: North- and east-facing side slopes of mountains
Parent material: Kind—residuum, colluvium; source—andesite, rhyolite
Slope features: Length—long; shape—concave
Dominant present vegetation: Mountain big sagebrush, antelope bitterbrush, rabbitbrush, basin wildrye
Typical profile:
0 to 7 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 6.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-4
7 to 57 inches—gravelly loam, gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC, CL-ML, CL; estimated AASHTO classification - A-4, A-6
57 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 5.7 to 7.4 inches
Water supplying capacity: 13 to 15 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.20; T value—3; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at the surface; distinctive present vegetation—barren
Inclusion 2: Position on landscape—narrow drainageways of mountains; contrasting features—moderately wet, very deep, slopes of 8 to 15 percent; distinctive present vegetation—basin wildrye, basin big sagebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 116)

Elements of Wildlife Habitat

Suitability of Quarz soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Bregar soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Duff soil for named elements:
Wild herbaceous plants (nonirrigated)—good
Shrubs (nonirrigated)—good

Ratings for Selected Uses

Quarz Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Bregar Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Duff Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 116.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Quarz	Bregar	Duff	1	2
Bluebunch wheatgrass	AGSP	30-50	2-5	15-30	---	---
Basin wildrye	ELCI2	5-10	---	5-10	---	50-60
Idaho fescue	FEID	2-5	10-30	15-40	---	---
Nevada bluegrass	PONE3	2-5	---	2-5	---	5-10
Thurber needlegrass	STTH2	2-10	---	T-10	---	---
Webber ricegrass	ORWE	---	5-10	---	---	---
Cusick bluegrass	POCU3	---	5-10	---	---	---
Sandberg bluegrass	POSE	---	5-10	---	---	---
Sedge	CAREX	---	---	---	---	1-5
Mat muhly	MURI	---	---	---	---	2-5
Other perennial grasses	PPGG	5-10	2-8	5-10	---	15-20
Lupine	LUPIN	2-5	---	---	---	2-5
Arrowleaf balsamroot	BASA3	2-5	---	5-10	---	---
Goldenweed	HAPLO2	---	2-5	---	---	---
Phlox	PHLOX	---	2-5	---	---	---
Hawksbeard	CREPI	---	2-5	1-5	---	---
Other perennial forbs	PPFF	2-5	5-10	5-15	---	5-10
Antelope bitterbrush	PUTR2	2-5	---	5-15	---	---
Mountain big sagebrush	ARTRV	5-10	---	10-15	---	---
Black sagebrush	ARARN	---	5-10	---	---	---
Low sagebrush	ARAR8	---	5-15	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	10-15
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5
Other shrubs	SSSS	2-10	2-10	5-15	---	---

Range site symbol	025X009N	025X024N	025X012N	BARREN	025X003N
Potential production (lb/acre):					
Favorable years	1,300	350	1,200	---	2,500
Normal years	900	250	900	---	1,900
Unfavorable years	700	150	600	---	1,200

Interpretive Groups

Capability classification: Quarz soil—VIIs, nonirrigated; Bregar soil—VIIs, nonirrigated; Duff soil—VIIe, nonirrigated

Range site symbol: Quarz soil—025X009N; Bregar soil—025X024N; Duff soil—025X012N

813—Quarz-Chen-Duff association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 6,200 to 7,600 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Quarz very gravelly loam, 15 to 50 percent slopes (Aridic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—40 percent
Chen gravelly loam, 15 to 50 percent slopes (Lithic Argixerolls - clayey-skeletal, montmorillonitic, frigid—30 percent
Duff gravelly loam, 30 to 50 percent slopes (Pachic Cryoborolls - fine-loamy, mixed)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Rubble land—4 percent
Inclusion 2: Rock outcrop—3 percent
Inclusion 3: Fluvaquentic Haplaquolls, drained, 4 to 15 percent slopes—3 percent

Quarz Soil

Positions on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum; source—sandstone, shale, quartzite, quartz latite
Slope features: Length—long; shape—convex
Dominant present vegetation: Big sagebrush, rabbitbrush, antelope bitterbrush, bluebunch wheatgrass
Typical profile:
0 to 5 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
5 to 30 inches—very gravelly clay loam, very gravelly clay; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
30 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 2.5 to 3.1 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Chen Soil

Positions on landscape: Crests and side slopes of mountains
Parent material: Kind—residuum; source—rhyolite, quartz latite, and quartz monzonite influenced by loess and volcanic ash
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, rabbitbrush, bluegrass
Typical profile:
0 to 9 inches—gravelly loam; 0 to 10 percent cobbles and stones and 30 to 40 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, CL-ML, CL; estimated AASHTO classification - A-4, A-6
9 to 17 inches—very gravelly clay, extremely gravelly clay, very cobbly clay; 5 to 45 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
17 inches—unweathered bedrock
Range in depth to bedrock: 14 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 1.6 to 2.0 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—1; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Duff Soil

Positions on landscape: North- and east-facing side slopes of mountains
Parent material: Kind—residuum, colluvium; source—andesite, rhyolite
Slope features: Length—long; shape—concave
Dominant present vegetation: Big sagebrush, rabbitbrush, antelope bitterbrush, lupine, basin wildrye, grasses
Typical profile:
0 to 7 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 6.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-4
7 to 57 inches—gravelly loam, gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC, CL-ML, CL; estimated AASHTO classification - A-4, A-6
57 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 5.7 to 7.4 inches
Water supplying capacity: 13 to 15 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.20; T value—3; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—concave side slopes of mountains; contrasting feature—more than 90 percent of surface covered with stones; distinctive present vegetation—barren
Inclusion 2: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at the surface; distinctive present vegetation—barren
Inclusion 3: Position on landscape—narrow drainageways of mountains; contrasting features—moderately wet, very deep; distinctive present vegetation—basin wildrye, basin big sagebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 117)

Elements of Wildlife Habitat

Suitability of Quarz soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Chen soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Duff soil for named elements:
Wild herbaceous plants (nonirrigated)—good
Shrubs (nonirrigated)—good

Ratings for Selected Uses

Quarz Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Chen Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—rooting depth, droughty, erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Duff Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope

TABLE 117.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Quarz	Chen	Duff	1	2	3
Bluebunch wheatgrass	AGSP	30-50	15-30	15-30	---	---	---
Basin wildrye	ELCI2	5-10	---	5-10	---	---	50-60
Idaho fescue	FEID	2-5	30-50	15-40	---	---	---
Nevada bluegrass	PONE3	2-5	---	2-5	---	---	5-10
Thurber needlegrass	STTH2	2-10	2-10	T-10	---	---	---
Bottlebrush squirreltail	SIHY	---	2-5	---	---	---	---
Sedge	CAREX	---	---	---	---	---	1-5
Mat muhly	MURI	---	---	---	---	---	2-5
Other perennial grasses	PPGG	5-10	2-10	5-10	---	---	15-20
Lupine	LUPIN	2-5	---	---	---	---	2-5
Arrowleaf balsamroot	BASA3	2-5	---	5-10	---	---	---
Balsamroot	BALSA	---	2-5	---	---	---	---
Hawksbeard	CREPI	---	---	1-5	---	---	---
Other perennial forbs	PPFF	2-5	5-15	5-15	---	---	5-10
Antelope bitterbrush	PUTR2	2-5	T-5	5-15	---	---	---
Mountain big sagebrush	ARTRV	5-10	---	10-15	---	---	---
Low sagebrush	ARAR8	---	10-25	---	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	---	10-15
Rubber rabbitbrush	CHNA2	---	---	---	---	---	2-5
Other shrubs	SSSS	2-10	5-10	5-15	---	---	---
Range site symbol		025X009N	025X017N	025X012N	BARREN	BARREN	025X003N
Potential production (lb/acre):							
Favorable years		1,300	1,000	1,200	---	---	2,500
Normal years		900	700	900	---	---	1,900
Unfavorable years		700	400	600	---	---	1,200

Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Quarz soil—VIIs, nonirrigated; Chen soil—VIIe, nonirrigated; Duff soil—VIIe, nonirrigated
Range site symbol: Quarz soil—025X009N; Chen soil—025X017N; Duff soil—025X012N

814—Quarz-Duff association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 6,400 to 7,300 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 43 degrees F
Frost-free season—about 80 days

Composition

Quarz very gravelly loam, 8 to 15 percent slopes (Aridic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—50 percent
Quarz very gravelly loam, 15 to 30 percent slopes (Aridic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—20 percent
Duff gravelly loam, 15 to 30 percent slopes (Pachic Cryoborolls - fine-loamy, mixed)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Quarz gravelly loam, 30 to 50 percent slopes (Aridic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—5 percent
Inclusion 2: Duff gravelly loam, 30 to 50 percent slopes (Pachic Cryoborolls - fine-loamy, mixed)—5 percent
Inclusion 3: Cumulic Haplaquolls, drained, 4 to 15 percent slopes—5 percent

Quarz, Strongly Sloping, Soil

Positions on landscape: South-, east-, and west-facing upper side slopes of mountains
Parent material: Kind—residuum; source—sandstone, shale, quartzite, quartz latite
Slope features: Length—long; shape—convex
Dominant present vegetation: Big sagebrush, Idaho fescue, serviceberry, rabbitbrush, antelope bitterbrush
Typical profile:
0 to 5 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
5 to 30 inches—very gravelly clay loam, very gravelly clay; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
30 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 2.5 to 3.1 inches
Water supplying capacity: 10 to 12 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Quarz, Moderately Steep, Soil

Positions on landscape: South-, east-, and west-facing middle and lower side slopes of mountains
Parent material: Kind—residuum; source—sandstone, shale, quartzite, quartz latite
Slope features: Length—long; shape—concave
Dominant present vegetation: Big sagebrush, rabbitbrush, basin wildrye, bluebunch wheatgrass, cheatgrass
Typical profile:
0 to 5 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
5 to 30 inches—very gravelly clay loam, very gravelly clay; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
30 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 2.5 to 3.1 inches
Water supplying capacity: 10 to 12 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low

Potential frost action: Low

Duff Soil

Positions on landscape: North- and east-facing side slopes of mountains
Parent material: Kind—residuum, colluvium; source—andesite, rhyolite
Slope features: Length—long; shape—concave
Dominant present vegetation: Big sagebrush, rabbitbrush, antelope bitterbrush, lupine, basin wildrye and other grasses
Typical profile:
0 to 7 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 6.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-4
7 to 57 inches—gravelly loam, gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC, CL-ML, CL; estimated AASHTO classification - A-4, A-6
57 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 5.7 to 7.4 inches
Water supplying capacity: 13 to 15 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.20; T value—3; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—south-, east-, and west-facing concave upper side slopes of mountains; contrasting feature—slopes of 30 to 50 percent; distinctive present vegetation—big sagebrush, rabbitbrush, basin wildrye, bluebunch wheatgrass, cheatgrass
Inclusion 2: Position on landscape—north- and east-facing concave upper side slopes of mountains; contrasting feature—slopes of 30 to 50 percent; distinctive present vegetation—big sagebrush, rabbitbrush, antelope bitterbrush, lupine, basin wildrye and other grasses
Inclusion 3: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—moderately wet, very deep; distinctive present vegetation—basin wildrye, basin big sagebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 118)

Elements of Wildlife Habitat

Suitability of Quarz, strongly sloping, soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Quarz, moderately steep, soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Duff soil for named elements:
Wild herbaceous plants (nonirrigated)—good
Shrubs (nonirrigated)—good

Ratings for Selected Uses

Quarz, Strongly Sloping, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock
Local roads and streets: Moderate—depth to rock, slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Quarz, Moderately Steep, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Duff Soil

Suitability and limitations for the following uses:

TABLE 118.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Quarz, strongly sloping	Quarz, moderately steep	Duff	1	2	3
Bluebunch wheatgrass	AGSP	20-30	30-50	15-30	30-50	15-30	---
Thurber needlegrass	STTH2	15-25	2-10	T-10	2-10	T-10	---
Nevada bluegrass	PONE3	2-10	2-5	2-5	2-5	2-5	5-10
Basin wildrye	ELCI2	---	5-10	5-10	5-10	5-10	50-60
Idaho fescue	FEID	---	2-5	15-40	2-5	15-40	---
Sedge	CAREX	---	---	---	---	---	1-5
Mat muhly	MURI	---	---	---	---	---	2-5
Other perennial grasses	PPGG	10-15	5-10	5-10	5-10	5-10	15-20
Lupine	LUPIN	---	2-5	---	2-5	---	2-5
Arrowleaf balsamroot	BASA3	---	2-5	5-10	2-5	5-10	---
Hawksbeard	CREPI	---	---	1-5	---	1-5	---
Other perennial forbs	PPFF	2-5	2-5	5-15	2-5	5-15	5-10
Big sagebrush	ARTR2	10-15	---	---	---	---	---
Douglas rabbitbrush	CHVI8	5-10	---	---	---	---	---
Antelope bitterbrush	PUTR2	---	2-5	5-15	2-5	5-15	---
Mountain big sagebrush	ARTRV	---	5-10	10-15	5-10	10-15	---
Basin big sagebrush	ARTRT*	---	---	---	---	---	10-15
Rubber rabbitbrush	CHNA2	---	---	---	---	---	2-5
Other shrubs	SSSS	---	2-10	5-15	2-10	5-15	---
Range site symbol		025X014N	025X009N	025X012N	025X009N	025X012N	025X003N
Potential production (lb/acre):							
Favorable years		1,000	1,300	1,200	1,300	1,200	2,500
Normal years		800	900	900	900	900	1,900
Unfavorable years		600	700	600	700	600	1,200

Rangeland seeding: Good
Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Quarz, strongly sloping, soil—IVs, irrigated, and VIIs, nonirrigated; Quarz, moderately steep, soil—VIIs, nonirrigated; Duff soil—VIe, nonirrigated
Range site symbol: Quarz, strongly sloping, soil—025X014N; Quarz, moderately steep, soil—025X009N; Duff soil—025X012N

821—Enko loam, 0 to 2 percent slopes

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 4,800 to 5,200 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 49 degrees F
Frost-free season—about 110 days

Composition

Enko loam, 0 to 2 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Natrargids, 0 to 2 percent slopes (Xerollic Natrargids - fine, montmorillonitic, mesic)—5 percent
Inclusion 2: Durorthidic Torriorthents, 0 to 2 percent slopes (Durorthidic Torriorthents - fine-silty, mixed, (calcareous), mesic)—5 percent
Inclusion 3: Xeric Torriorthents, strongly alkaline, 0 to 2 percent slopes—5 percent

Enko Soil

Positions on landscape: Inset fans
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Big sagebrush, bottlebrush squirreltail, mustard, cheatgrass
Typical profile:
0 to 6 inches—loam; 0 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
6 to 20 inches—sandy loam, fine sandy loam, loam; 0 to 15 percent pebbles (by weight); massive; hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
20 to 36 inches—sandy loam, fine sandy loam, loam; 0 to 25 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 20 to 40); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-2, A-4
36 to 63 inches or more—sandy loam, fine sandy loam, loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 20 to 40); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification - A-2, A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 7.4 to 10.1 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth summits of adjacent fan piedmonts; contrasting feature—layer of clay accumulation that is slightly sodic; distinctive present vegetation—big sagebrush, bottlebrush squirreltail
Inclusion 2: Position on landscape—lower part of inset fans adjacent to channels; contrasting feature—silty throughout the profile; distinctive present vegetation—big sagebrush, bottlebrush squirreltail
Inclusion 3: Position on landscape—lower part of inset fans adjacent to alluvial flat remnants; contrasting feature—salt- and sodium-affected throughout the profile; distinctive present vegetation—black greasewood, basin wildrye, basin big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 119)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Good

TABLE 119.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Enko	1	2	3
Bluebunch wheatgrass	AGSP	10-40	10-40	10-40	---
Thurber needlegrass	STTH2	10-40	10-40	10-40	---
Basin wildrye	ELCI2	5-15	5-15	5-15	5-10
Indian ricegrass	ORHY	2-10	2-10	2-10	2-5
Webber ricegrass	ORWE	2-10	2-10	2-10	---
Bluegrass	POA++	2-10	2-10	2-10	---
Bottlebrush squirreltail	SIHY	---	---	---	2-5
Other perennial grasses	PPGG	5-10	5-10	5-10	2-5
Thelypody	THELY	---	---	---	2-4
Globemallow	SPHAE	---	---	---	1-2
Other perennial forbs	PPFF	5-10	5-10	5-10	1-2
Big sagebrush	ARTR2	10-15	10-15	10-15	---
Black greasewood	SAVE4	---	---	---	20-30
Basin big sagebrush	ARTRT*	---	---	---	10-25
Spiny hopsage	GRSP	---	---	---	5-15
Other shrubs	SSSS	5-15	5-15	5-15	2-10
Range site symbol		025X019N	025X019N	025X019N	024X022N
Potential production (lb/acre):					
Favorable years		800	800	800	800
Normal years		600	600	600	600
Unfavorable years		400	400	400	350

Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIs, irrigated, and VIc, nonirrigated
Range site symbol: 025X019N

822—Enko-Davey-McConnel association

Map Unit Setting

Positions on landscape: Fan skirts
Elevation: 4,700 to 5,500 feet
Climatic data (average annual):
Precipitation—about 8 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Enko loam, 2 to 4 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, mesic)—50 percent
Davey sandy loam, 0 to 4 percent slopes (Xerollic Camborthids - sandy, mixed, mesic)—20 percent
McConnel loam, 2 to 4 percent slopes (Xerollic Camborthids - sandy-skeletal, mixed, mesic)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Durixerollic Camborthids, 0 to 4 percent slopes (Durixerollic Camborthids - loamy-skeletal, mixed, mesic)—5 percent
Inclusion 2: Durorthidic Xeric Torriorthents, 0 to 2 percent slopes (Durorthidic Xeric Torriorthents - coarse-silty, mixed (calcareous), mesic)—5 percent

Enko Soil

Positions on landscape: Lower part of fan skirts
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Big sagebrush, bottlebrush squirreltail, mustard, cheatgrass
Typical profile:
0 to 6 inches—loam; 0 to 5 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
6 to 20 inches—sandy loam, fine sandy loam, loam; 0 to 15 percent pebbles (by weight); massive; hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
20 to 36 inches—sandy loam, fine sandy loam, loam; 0 to 25 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 20 to 40); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-2, A-4
36 to 63 inches or more—sandy loam, fine sandy loam, loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 20 to 40); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification - A-2, A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 7.4 to 10.1 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Davey Soil

Positions on landscape: Upper part of fan skirts
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Big sagebrush, bluegrass, cheatgrass
Typical profile:
0 to 6 inches—sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, ML; estimated AASHTO classification - A-4
6 to 18 inches—sandy loam, loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification - SM, ML; estimated AASHTO classification - A-2, A-4
18 to 60 inches or more—stratified loamy sand to gravelly sand; 0 to 5 percent cobbles and stones and 15 to 25 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification - SM; estimated AASHTO classification - A-1, A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None

Permeability: In the upper 18 inches—moderately rapid; below this depth—rapid
Available water capacity: 2.8 to 4.7 inches
Water supplying capacity: 7 to 9 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.32; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

McConnel Soil

Positions on landscape: On-fan drainageways
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Big sagebrush, spiny hopsage, bluegrass, bottlebrush squirreltail, mustard
Typical profile:
0 to 13 inches—loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - ML; estimated AASHTO classification - A-4
13 to 62 inches or more—stratified very gravelly sandy loam to very gravelly coarse sand; 0 to 15 percent cobbles and stones and 65 to 90 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - GP; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 17 inches—moderately rapid; below this depth—very rapid
Available water capacity: 3.2 to 4.6 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.37; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—narrow inset fans adjacent to channels; contrasting features—very gravelly loam throughout the profile, layer of silica accumulation; distinctive present vegetation—big sagebrush, bottlebrush squirreltail
Inclusion 2: Position on landscape—lower part of fan skirts adjacent to alluvial flat remnants; contrasting feature—silty throughout the profile; distinctive present vegetation—big sagebrush, bottlebrush squirreltail

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 120)

Elements of Wildlife Habitat

Suitability of Enko soil for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor
Suitability of Davey soil for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor
Suitability of McConnel soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—very poor
Shallow water areas—very poor

Ratings for Selected Uses

Enko Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Davey Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty, excess salt
Roadfill: Good
Daily cover for landfill: Poor—too sandy

TABLE 120.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Enko	Davey	McConnel	1	2
Bluebunch wheatgrass	AGSP	10-40	---	10-40	10-40	10-40
Thurber needlegrass	STTH2	10-40	---	10-40	10-40	10-40
Basin wildrye	ELCI2	5-15	---	5-15	5-15	5-15
Indian ricegrass	ORHY	2-10	15-20	2-10	2-10	2-10
Webber ricegrass	ORWE	2-10	---	2-10	2-10	2-10
Bluegrass	POA++	2-10	---	2-10	2-10	2-10
Needleandthread	STCO4	---	20-30	---	---	---
Bottlebrush squirreltail	SIHY	---	2-5	---	---	---
Thickspike wheatgrass	AGDA	---	2-10	---	---	---
Other perennial grasses	PPGG	5-10	2-5	5-10	5-10	5-10
Perennial forbs	PPFF	5-10	10-20	5-10	5-10	5-10
Big sagebrush	ARTR2	10-15	10-20	10-15	10-15	10-15
Spiny hopsage	GRSP	---	2-5	---	---	---
Other shrubs	SSSS	5-15	2-10	5-15	5-15	5-15
Range site symbol		025X019N	024X017N	025X019N	025X019N	025X019N
Potential production (lb/acre):						
Favorable years		800	900	800	800	800
Normal years		600	700	600	600	600
Unfavorable years		400	500	400	400	400

Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Moderate—seepage, piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

McConnel Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty
Roadfill: Good
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess salt
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: Enko soil—IIe, irrigated, and VIc, nonirrigated; Davey soil—IVe, irrigated, and VIIc, nonirrigated; McConnel soil—IVe, irrigated, and VIIc, nonirrigated
Range site symbol: Enko soil—025X019N; Davey soil—024X017N; McConnel soil—025X019N

823—Enko-Puett association

Map Unit Setting

Positions on landscape: Inset fans, hills
Elevation: 5,200 to 5,400 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Enko loam, 4 to 15 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, mesic)—50 percent
Puett fine sandy loam, 15 to 30 percent slopes (Xeric Torriorthents - loamy, mixed (calcareous), mesic, shallow)—35 percent
Contrasting inclusions as follows:
Inclusion 1: Durorthidic Xeric Torriorthents, 2 to 8 percent slopes (Durorthidic Xeric Torriorthents - coarse-silty, mixed (calcareous), mesic)—10 percent
Inclusion 2: Badland—5 percent

Enko Soil

Positions on landscape: Inset fans adjacent to hills
Parent material: Mixed alluvium
Slope features: Length—short; shape—smooth
Dominant present vegetation: Big sagebrush, bottlebrush squirreltail, mustard, cheatgrass
Typical profile:
0 to 6 inches—loam; 0 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
6 to 20 inches—sandy loam, fine sandy loam, loam; 0 to 15 percent pebbles (by weight); massive; hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
20 to 36 inches—sandy loam, fine sandy loam, loam; 0 to 25 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 20 to 40); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-2, A-4
36 to 63 inches or more—sandy loam, fine sandy loam, loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 20 to 40); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification - A-2, A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 7.4 to 10.1 inches
Water supplying capacity: 8 to 10 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—5
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Puett Soil

Positions on landscape: Crests of low hills
Parent material: Kind—residuum; source—semiconsolidated tuff, shale, siltstone, sandstone
Slope features: Length—short; shape—convex
Dominant present vegetation: Black sagebrush, big sagebrush, Indian ricegrass, basin wildrye, Douglas rabbitbrush
Typical profile:
0 to 5 inches—fine sandy loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-4
5 to 17 inches—coarse sandy loam, fine sandy loam, silt loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, ML; estimated AASHTO classification - A-1, A-2, A-4
17 inches—weathered bedrock
Range in depth to bedrock: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately rapid
Available water capacity: 2.2 to 2.5 inches
Water supplying capacity: 7 to 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.28; T value—1; wind erodibility group—3
Hazard of erosion: By water—moderate; by wind—slight

Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—on-fan drainageways; contrasting feature—silty throughout the profile; distinctive present vegetation—big sagebrush, bottlebrush squirreltail
Inclusion 2: Position on landscape—dissected severely eroded side slopes of hills; contrasting feature—soft geological material exposed at surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 121)

Elements of Wildlife Habitat

Suitability of Enko soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—very poor
Shallow water areas—very poor
Suitability of Puett soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Enko Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, erodes easily
Roadfill: Good

TABLE 121.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Enko	Puett	1	2
Bluebunch wheatgrass	AGSP	10-40	---	10-40	---
Thurber needlegrass	STTH2	10-40	---	10-40	---
Basin wildrye	ELCI2	5-15	---	5-15	---
Indian ricegrass	ORHY	2-10	10-30	2-10	---
Webber ricegrass	ORWE	2-10	---	2-10	---
Bluegrass	POA++	2-10	---	2-10	---
Bottlebrush squirreltail	SIHY	---	5-10	---	---
Other perennial grasses	PPGG	5-10	10-20	5-10	---
Perennial forbs	PPFF	5-10	---	5-10	---
Big sagebrush	ARTR2	10-15	---	10-15	---
Black sagebrush	ARARN	---	5-15	---	---
Wyoming big sagebrush	ARTRW*	---	10-25	---	---
Other shrubs	SSSS	5-15	2-5	5-15	---
Range site symbol		025XO19N	025XO25N	025XO19N	BARREN
Potential production (lb/acre):					
Favorable years		800	200	800	---
Normal years		600	150	600	---
Unfavorable years		400	100	400	---

Daily cover for landfill: Fair—slope
Shallow excavations: Moderate—slope
Local roads and streets: Moderate—frost action, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Puett Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, erodes easily
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Enko soil—IVe, irrigated, and VIc, nonirrigated; Puett soil—VIIe, nonirrigated
Range site symbol: Enko soil—025X019N; Puett soil—025X025N

830—Atrypa gravelly loam, 30 to 50 percent slopes

Map Unit Setting

Positions on landscape: Side slopes of low mountains
Elevation: 6,500 to 7,800 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 44 degrees F
Frost-free season—about 70 days

Composition

Atrypa gravelly loam, 30 to 50 percent slopes (Calciorthidic Haploxerolls - loamy, mixed, frigid, shallow)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Aridic Haploxerolls, 8 to 30 percent slopes—10 percent
Inclusion 2: Aridic Haploxerolls, 2 to 8 percent slopes—3 percent
Inclusion 3: Rock outcrop—2 percent

Atrypa Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—shale
Slope features: Length—long; shape—smooth to convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, Sandberg bluegrass
Typical profile:
0 to 10 inches—gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GM; estimated AASHTO classification - A-4
10 to 14 inches—loam, gravelly loam; 10 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, ML, GM-GC, GM; estimated AASHTO classification - A-4
14 inches—weathered bedrock
Range in depth to bedrock: 11 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 1.9 to 2.0 inches
Water supplying capacity: 10 to 11 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—1; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—concave side slopes of mountains; contrasting features—deep to bedrock, slopes of 8 to 30 percent, higher available water capacity; distinctive present vegetation—mountain big sagebrush, bluebunch wheatgrass, basin wildrye
Inclusion 2: Position on landscape—concave foot slopes of low mountains; contrasting features—slopes of 2 to 8 percent, very deep; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass
Inclusion 3: Position on landscape—scattered areas on crests and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat, woodland

Potential Native Plant Community (Table 122)

Woodland

Site index for common trees: Singleleaf pinyon—45; Utah juniper—45
Most important native understory plants: Bluebunch wheatgrass, Thurber needlegrass, basin wildrye, Indian ricegrass, big sagebrush, antelope bitterbrush

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIe, nonirrigated
Woodland suitability group: 3r

TABLE 122.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Atrypa	1	2	3
Indian ricegrass	ORHY	X	---	5-10	---
Needleandthread	STCO4	X	---	2-5	---
Pine bluegrass	POSC	X	---	2-5	---
Bluebunch wheatgrass	AGSP	X	10-15	5-10	---
Nevada bluegrass	PONE3	X	---	---	---
Thurber needlegrass	STTH2	X	5-10	20-30	---
Bottlebrush squirreltail	SIHY	X	---	---	---
Sandberg bluegrass	POSE	X	2-5	2-5	---
Basin wildrye	ELCI2	---	5-10	---	---
Western wheatgrass	AGSM	---	1-4	1-2	---
Other perennial grasses	PPGG	X	10-15	5-8	---
Tapertip hawksbeard	CRAC2	---	---	2-5	---
Arrowleaf balsamroot	BASA3	---	---	2-5	---
Lupine	LUPIN	---	---	2-5	---
White stoneseed	LIRU4	---	---	1-5	---
Other perennial forbs	PPFF	X	5-15	---	---
Annual forbs	AAFF	---	---	2-5	---
Big sagebrush	ARTR2	X	---	10-15	---
Utah juniper	JUOS	X	---	---	---
Singleleaf pinyon	PIMO	X	---	---	---
Mountain big sagebrush	ARTRV	---	15-25	---	---
Serviceberry	AMELA	---	3-10	---	---
Antelope bitterbrush	PUTR2	---	2-8	1-10	---
Rabbitbrush	CHRYS9	---	---	2-5	---
Other shrubs	SSSS	X	15-20	5-10	---
Range site symbol		---	028B027N	028B007N	BARREN
Woodland site symbol		025X062N	---	---	---
Potential production (lb/acre):					
Favorable years		500	900	1,000	---
Normal years		300	600	800	---
Unfavorable year		250	300	600	---

831—Atrypa-Mau association

Map Unit Setting

Positions on landscape: Side slopes of low mountains
Elevation: 6,500 to 7,800 feet
Climatic data (average annual):
Precipitation—about 13 inches
Air temperature—about 44 degrees F
Frost-free season—about 70 days

Composition

Atrypa gravelly loam, 15 to 30 percent slopes (Calciorthidic Haploxerolls - loamy, mixed, frigid, shallow)—75 percent
Mau gravelly loam, 15 to 30 percent slopes (Durixerollic Haplargids - clayey-skeletal, montmorillonitic, frigid)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Haplargids, 4 to 15 percent slopes—5 percent
Inclusion 2: Aridic Haploxerolls, 2 to 8 percent slopes—3 percent
Inclusion 3: Rock outcrop—2 percent

Atrypa Soil

Positions on landscape: Upper and middle side slopes of mountains
Parent material: Kind—residuum, colluvium; source—shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, Sandberg bluegrass, Indian ricegrass
Typical profile:
0 to 10 inches—gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GM; estimated AASHTO classification - A-4
10 to 14 inches—loam, gravelly loam; 10 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, ML, GM-GC, GM; estimated AASHTO classification - A-4
14 inches—weathered bedrock
Range in depth to bedrock: 11 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 1.9 to 2.0 inches
Water supplying capacity: 10 to 11 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—1; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Mau Soil

Positions on landscape: Lower side slopes of low mountains
Parent material: Kind—residuum, colluvium; source—andesite, basalt
Slope features: Length—long; shape—concave
Dominant present vegetation: Big sagebrush, Thurber needlegrass, bluebunch wheatgrass
Typical profile:
0 to 4 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, CL, GM-GC, GC; estimated AASHTO classification - A-2, A-4, A-6
4 to 24 inches—very gravelly clay, very gravelly clay loam; 0 to 10 percent cobbles and stones and 55 to 75 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
24 to 34 inches—extremely gravelly clay loam, very gravelly clay; 0 to 10 percent cobbles and stones and 55 to 90 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GP-GC; estimated AASHTO classification - A-2
34 inches—unweathered bedrock
Range in depth to bedrock: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 3.3 to 3.8 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—7

Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—convex lower side slopes and foot slopes of mountains; contrasting features—deep, does not have a layer of weak cementation; distinctive present vegetation—big sagebrush, Thurber needlegrass, Indian ricegrass
Inclusion 2: Position on landscape—concave foot slopes of mountains; contrasting features—very deep, does not have a layer of weak cementation; distinctive present vegetation—big sagebrush, Thurber needlegrass, Indian ricegrass
Inclusion 3: Position on landscape—small scattered areas on upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Woodland

Potential Native Plant Community (Table 123)

Woodland

Atrypa Soil

Site index for common trees: Singleleaf pinyon—45; Utah juniper—40
Most important native understory plants: Thurber needlegrass, needleandthread, Sandberg bluegrass, tapertip hawksbeard, big sagebrush, antelope bitterbrush

Elements of Wildlife Habitat

Suitability of Atrypa soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—poor
Suitability of Mau soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Atrypa Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Mau Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty, erodes easily
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIe, nonirrigated
Woodland suitability group: Atrypa soil—3d
Range site symbol: Mau soil—028B007N

TABLE 123.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Atrypa	Mau	1	2	3
Indian ricegrass	ORHY	X	5-10	5-10	---	5-10
Needleandthread	STCO4	X	2-5	2-5	---	2-5
Pine bluegrass	POSC	X	2-5	2-5	---	2-5
Bluebunch wheatgrass	AGSP	X	5-10	5-10	---	5-10
Nevada bluegrass	PONE3	X	---	---	---	---
Thurber needlegrass	STTH2	X	20-30	20-30	---	20-30
Bottlebrush squirreltail	SIHY	X	---	---	---	---
Sandberg bluegrass	POSE	X	2-5	2-5	---	2-5
Western wheatgrass	AGSM	---	1-2	1-2	---	1-2
Other perennial grasses	PPGG	X	5-8	5-8	---	5-8
Tapertip hawksbeard	CRAC2	---	2-5	2-5	---	2-5
Arrowleaf balsamroot	BASA3	---	2-5	2-5	---	2-5
Lupine	LUPIN	---	2-5	2-5	---	2-5
White stoneseed	LIRU4	---	1-5	1-5	---	1-5
Other perennial forbs	PPFF	X	---	---	---	---
Annual forbs	AAFF	---	2-5	2-5	---	2-5
Big sagebrush	ARTR2	X	10-15	10-15	---	10-15
Utah juniper	JUOS	X	---	---	---	---
Singleleaf pinyon	PIMO	X	---	---	---	---
Rabbitbrush	CHRYS9	---	2-5	2-5	---	2-5
Antelope bitterbrush	PUTR2	---	1-10	1-10	---	1-10
Other shrubs	SSSS	X	5-10	5-10	---	5-10
Range site symbol		---	028B007N	028B007N	BARREN	028B007N
Woodland site symbol		025X062N	---	---	---	---
Potential production (lb/acre):						
Favorable years		500	1,000	1,000	---	1,000
Normal years		300	800	800	---	800
Unfavorable years		250	600	600	---	600

841—Kodra loam, 0 to 4 percent slopes

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 5,100 to 5,600 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 48 degrees F
Frost-free season—about 100 days

Composition

Kodra loam, 0 to 4 percent slopes (Haploxerollic Durorthids - coarse-loamy, mixed, mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Haploxerollic Durorthids, 2 to 4 percent slopes (Haploxerollic Durorthids - loamy, mixed, mesic, shallow)—5 percent
Inclusion 2: Durixerollic Camborthids, 0 to 4 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, mesic)—5 percent
Inclusion 3: Xeric Torriorthents, 0 to 2 percent slopes (Xeric Torriorthents - coarse-silty, mixed, mesic)—5 percent

Kodra Soil

Positions on landscape: Lower part of fan piedmonts
Parent material: Kind—alluvium; source—basalt, rhyolite, and other siliceous rocks influenced by volcanic ash
Slope features: Length—long; shape—smooth to slightly convex
Dominant present vegetation: Wyoming big sagebrush, bluegrass, Thurber needlegrass, cheatgrass
Typical profile:
0 to 5 inches—loam; 0 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 28 inches—loam, sandy loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-2, A-4
28 to 48 inches—cemented hardpan
48 to 60 inches or more—stratified sand to silty clay; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
Range in depth to hardpan: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 3.8 to 4.8 inches
Water supplying capacity: 7 to 10 inches
Runoff: Slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.43; T value—2; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—slightly concave parts of fan piedmonts; contrasting feature—hardpan at a depth of less than 20 inches; distinctive present vegetation—Wyoming big sagebrush, bluegrass, Thurber needlegrass, cheatgrass
Inclusion 2: Position on landscape—smooth fan skirts along the lower margin of fan piedmonts; contrasting feature—layer of weak silica cementation at a depth of 20 to 40 inches; distinctive present vegetation—Wyoming big sagebrush, bluegrass, Thurber needlegrass, cheatgrass
Inclusion 3: Position on landscape—inset fans dissecting the fan piedmonts; contrasting features—silty throughout the profile, does not have a hardpan; distinctive present vegetation—Wyoming big sagebrush, bluegrass, Thurber needlegrass, cheatgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 124)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan, cutbanks cave

TABLE 124.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Kodra	1	2	3
Bluebunch wheatgrass	AGSP	10-40	10-40	10-40	10-40
Thurber needlegrass	STTH2	10-40	10-40	10-40	10-40
Basin wildrye	ELCI2	5-15	5-15	5-15	5-15
Indian ricegrass	ORHY	2-10	2-10	2-10	2-10
Webber ricegrass	ORWE	2-10	2-10	2-10	2-10
Bluegrass	POA++	2-10	2-10	2-10	2-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10
Perennial forbs	PPFF	5-10	5-10	5-10	5-10
Big sagebrush	ARTR2	10-15	10-15	10-15	10-15
Other shrubs	SSSS	5-15	5-15	5-15	5-15
Range site symbol		025X019N	025X019N	025X019N	025X019N
Potential production (lb/acre):					
Favorable years		800	800	800	800
Normal years		400	400	400	400
Unfavorable years		600	600	600	600

Local roads and streets: Moderate—cemented pan, frost action
Pond reservoir areas: Moderate—seepage, cemented pan, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIs, nonirrigated
Range site symbol: 025X019N

851—Glean-Gando association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 6,500 to 8,000 feet
Climatic data (average annual):
Precipitation—about 15 inches
Air temperature—about 44 degrees F
Frost-free season—about 70 days

Composition

Glean very gravelly loam, 50 to 75 percent slopes (Pachic Haploxerolls - loamy-skeletal, mixed, frigid)—50 percent
Gando extremely stony loam, 50 to 75 percent slopes (Lithic Haploxerolls - loamy-skeletal, mixed, frigid)—35 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—8 percent
Inclusion 2: Welch loam, drained, 8 to 15 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—3 percent
Inclusion 3: Lithic Cryoborolls, 15 to 50 percent slopes—2 percent
Inclusion 4: Welch loam, 2 to 8 percent slopes (Cumulic Haplaquolls - fine loamy, mixed, frigid)—2 percent

Glean Soil

Positions on landscape: Concave north-facing side slopes of mountains
Parent material: Kind—residuum, colluvium; source—chert, shale, volcanic rocks
Slope features: Length—long; shape—smooth to concave
Dominant present vegetation: Mountain big sagebrush, basin wildrye, snowberry, Idaho fescue, bluebunch wheatgrass
Typical profile:
0 to 14 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; slightly acid (pH 6.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
14 to 56 inches—very gravelly sandy loam, very gravelly loam; 10 to 25 percent cobbles and stones and 40 to 75 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 6.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
56 inches—unweathered bedrock
Range in depth to bedrock: 50 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately rapid
Available water capacity: 3.4 to 5.6 inches
Water supplying capacity: 11 to 15 inches
Runoff: Very rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.10; T value—3; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—moderate
Potential frost action: Moderate

Gando Soil

Positions on landscape: Convex crests and side slopes of mountains
Parent material: Kind—residuum; source—mixed sedimentary rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, black sagebrush, Thurber needlegrass, Indian ricegrass, western wheatgrass
Typical profile:
0 to 5 inches—extremely stony loam; 25 to 30 percent cobbles and stones and 30 to 40 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-2, A-4
5 to 15 inches—very gravelly loam, extremely gravelly loam; 10 to 25 percent cobbles and stones and 60 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
15 inches—unweathered bedrock
Range in depth to bedrock: 12 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 1.1 to 1.4 inches
Water supplying capacity: 10 to 12 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—1; wind erodibility group—8

Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock; distinctive present vegetation—barren
Inclusion 2: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, moderately wet; distinctive present vegetation—basin big sagebrush, basin wildrye, rabbitbrush
Inclusion 3: Position on landscape—convex windswept north-facing crests and upper side slopes of mountains; contrasting feature—cooler summer soil temperatures; distinctive present vegetation—low sagebrush, Idaho fescue
Inclusion 4: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, wet; distinctive present vegetation—sedge, willow, tufted hairgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 125)

Elements of Wildlife Habitat

Suitability of Glean soil for named elements:
Wild herbaceous plants (nonirrigated)—good
Shrubs (nonirrigated)—good
Suitability of Gando soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Glean Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones
Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Poor—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Gando Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, large stones, erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIe, nonirrigated
Range site symbol: Glean soil—028B030N; Gando soil—028B034N

TABLE 125.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Glean	Gando	1	2	3	4
Bluebunch wheatgrass	AGSP	10-20	10-15	---	5-10	---	---
Basin wildrye	ELCI2	2-5	---	---	---	30-50	---
Pine bluegrass	POSC	2-5	---	---	5-10	---	---
Idaho fescue	FEID	2-5	2-5	---	10-15	---	---
Thurber needlegrass	STTH2	5-10	2-5	---	2-5	---	---
Western wheatgrass	AGSM	1-5	2-5	---	---	5-10	---
Bottlebrush squirreltail	SIHY	---	1-2	---	2-5	---	---
Indian ricegrass	ORHY	---	5-10	---	2-5	---	---
Letterman needlegrass	STLE4	---	1-2	---	2-5	---	---
Sandberg bluegrass	POSE	---	2-5	---	---	---	---
Nevada bluegrass	PONE3	---	---	---	---	5-10	5-10
Tufted hairgrass	DECA5	---	---	---	---	---	30-60
Sedge	CAREX	---	---	---	---	---	5-10
Alpine timothy	PHAL2	---	---	---	---	---	5-10
Other perennial grasses	PPGG	10-20	2-5	---	10-15	5-15	2-10
Sierra clover	TRWO	---	---	---	---	---	2-5
Cinquefoil	POTEN	---	---	---	---	---	2-5
Other perennial forbs	PPFF	5-12	5-10	---	5-10	5-10	10-20
Serviceberry	AMELA	2-10	---	---	---	---	---
Antelope bitterbrush	PUTR2	5-10	---	---	---	---	---
Horsebrush	TETRA3	1-2	2-5	---	2-5	---	---
Mountain big sagebrush	ARTRV	15-25	---	---	---	1-2	---
Low sagebrush	ARAR8	---	20-35	---	20-35	---	---
Snowberry	SYMPH	---	2-5	---	2-5	---	---
Low rabbitbrush	CHVIH2	---	---	---	2-5	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	5-10	---
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5	---
Willow	SALIX	---	---	---	---	---	2-5
Other shrubs	SSSS	5-15	5-10	---	5-10	5-10	---

Range site symbol	028B030N	028B034N	BARREN	028B038N	028B024N	025X005N
Potential production (lb/acre):						
Favorable years	1,100	600	---	800	2,800	2,000
Normal years	800	400	---	600	1,700	1,700
Unfavorable years	600	250	---	400	1,000	1,000

861—Zineb gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Positions on landscape: Fan aprons, fan skirts
Elevation: 4,700 to 5,300 feet
Climatic data (average annual):
Precipitation—about 8 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Zineb gravelly loam, 2 to 8 percent slopes (Durixerollic Camborthids - loamy-skeletal, mixed, mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Haploxerollic Durargids, 2 to 8 percent slopes (Haploxerollic Durargids - fine-loamy, mixed, mesic)—5 percent
Inclusion 2: Durixerollic Camborthids, 2 to 8 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, mesic)—5 percent
Inclusion 3: Xerollic Natrargids, 2 to 8 percent slopes (Xerollic Natrargids - fine, montmorillonitic, mesic)—5 percent

Zineb Soil

Positions on landscape: Fan aprons, fan skirts
Parent material: Kind—alluvium; source—basalt, rhyolite
Slope features: Length—long; shape—smooth
Dominant present vegetation: Big sagebrush, gray horsebrush, mustard, bluegrass, bottlebrush squirreltail, cheatgrass
Typical profile:
0 to 6 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
6 to 13 inches—gravelly loam, gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4
13 to 19 inches—very gravelly sandy loam, very gravelly loam; 0 to 10 percent cobbles and stones and 45 to 75 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-1
19 to 27 inches—extremely cobbly sandy loam; 50 to 75 percent cobbles and stones and 55 to 85 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - GP-GM, GM; estimated AASHTO classification - A-1
27 to 68 inches or more—extremely cobbly coarse sand, extremely cobbly loamy coarse sand; 50 to 75 percent cobbles and stones and 55 to 85 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - GP-GM, GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 13 inches—moderately rapid; below this depth—rapid
Available water capacity: 2.0 to 3.4 inches
Water supplying capacity: 7 to 9 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.32; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—side slopes of adjacent smooth fan piedmonts; contrasting features—moderately deep to a strongly silica-cemented hardpan, layer of clay accumulation; distinctive present vegetation—big sagebrush, gray horsebrush, mustard, bluegrass, bottlebrush squirreltail, cheatgrass
Inclusion 2: Position on landscape—lower part of fan skirts and fan aprons; contrasting feature—nongravelly and loamy throughout the profile; distinctive present vegetation—big sagebrush, gray horsebrush, mustard, bluegrass, bottlebrush squirreltail, cheatgrass
Inclusion 3: Position on landscape—summits of adjacent smooth fan piedmont remnants; contrasting features—nongravelly and clayey, sodium-affected layer of clay accumulation; distinctive present vegetation—big sagebrush, gray horsebrush, mustard, bluegrass, bottlebrush squirreltail, cheatgrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 126)

Elements of Wildlife Habitat

Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty
Roadfill: Fair—large stones
Daily cover for landfill: Poor—too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action, large stones
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—large stones
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Interpretive Groups

Capability classification: IVe, irrigated, and VIIc, nonirrigated
Range site symbol: 025X019N

TABLE 126.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Zineb	1	2	3
Bluebunch wheatgrass	AGSP	10-40	10-40	10-40	10-40
Thurber needlegrass	STTH2	10-40	10-40	10-40	10-40
Basin wildrye	ELCI2	5-15	5-15	5-15	5-15
Indian ricegrass	ORHY	2-10	2-10	2-10	2-10
Webber ricegrass	ORWE	2-10	2-10	2-10	2-10
Bluegrass	POA++	2-10	2-10	2-10	2-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10
Perennial forbs	PPFF	5-10	5-10	5-10	5-10
Big sagebrush	ARTR2	10-15	10-15	10-15	10-15
Other shrubs	SSSS	5-15	5-15	5-15	5-15
Range site symbol		025X019N	025X019N	025X019N	025X019N
Potential production (lb/acre):					
Favorable years		600	600	600	600
Normal years		800	800	800	800
Unfavorable years		400	400	400	400

870—Fortank very stony loam, 4 to 8 percent slopes

Map Unit Setting

Positions on landscape: Side slopes of hills
Elevation: 6,200 to 6,800 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Fortank very stony loam, 4 to 8 percent slopes (Xerollic Haplargids - fine, montmorillonitic, frigid)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Abruptic Xerollic Durargids, 4 to 15 percent slopes—8 percent
Inclusion 2: Hayeston sandy loam, 2 to 8 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), frigid)—5 percent
Inclusion 3: Haploxerollic Durorthids, 4 to 8 percent slopes—2 percent

Fortank Soil

Positions on landscape: Side slopes of hills
Parent material: Kind—residuum; source—andesite, rhyolite, quartzite
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, Indian ricegrass, rabbitbrush, bottlebrush squirreltail
Typical profile:
0 to 10 inches—very stony loam; 25 to 30 percent cobbles and stones and 30 to 40 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-2, A-4
10 to 35 inches—gravelly clay, gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, CL; estimated AASHTO classification - A-7
35 inches—weathered bedrock
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 3.4 to 4.3 inches
Water supplying capacity: 7.5 to 9.5 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth to slightly concave adjacent fan piedmonts; contrasting feature—moderately deep to an indurated silica-cemented hardpan; distinctive present vegetation—black sagebrush, Indian ricegrass
Inclusion 2: Position on landscape—inset fans adjacent to or between hills; contrasting features—very deep, does not have a layer of clay accumulation; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass, rabbitbrush, bottlebrush squirreltail
Inclusion 3: Position on landscape—slightly convex adjacent erosional fan piedmonts; contrasting features—strongly silica-cemented hardpan, does not have a layer of clay accumulation; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass, rabbitbrush, bottlebrush squirreltail

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 127)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—large stones
Roadfill: Poor—depth to rock, low strength, shrink-swell
Daily cover for landfill: Poor—depth to rock, small stones
Shallow excavations: Moderate—depth to rock, too clayey
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Moderate—depth to rock, slope
Embankments, dikes, and levees: Moderate—thin layer, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 127.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Fortank	1	2	3
Indian ricegrass	ORHY	20-30	20-30	20-30	15-25
Needleandthread	STCO4	10-20	10-20	10-20	5-10
Bottlebrush squirreltail	SIHY	5-10	5-10	5-10	---
Sandberg bluegrass	POSE	2-5	2-5	2-5	---
Bluebunch wheatgrass	AGSP	---	---	---	2-5
Basin wildrye	ELCI2	---	---	---	2-5
Other perennial grasses	PPGG	5-10	5-10	5-10	10-20
Perennial forbs	PPFF	2-5	2-5	2-5	5-10
Wyoming big sagebrush	ARTRW*	15-20	15-20	15-20	---
Black sagebrush	ARARN	---	---	---	20-30
Bud sagebrush	ARSP5	---	---	---	2-5
Winterfat	EULA5	---	---	---	5-10
Small rabbitbrush	CHVIS	---	---	---	2-5
Other shrubs	SSSS	5-10	5-10	5-10	10-20
Range site symbol		028B010N	028B010N	028B010N	028B011N
Potential production (lb/acre):					
Favorable years		600	600	600	700
Normal years		800	800	800	900
Unfavorable years		400	400	400	400

Interpretive Groups

Range site symbol: 028B010N

Capability classification: VIIs, nonirrigated

871—Fortank association

Map Unit Setting

Positions on landscape: Side slopes of mountains
Elevation: 5,000 to 6,100 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Fortank gravelly loam, 15 to 30 percent slopes (Xerollic Haplargids - fine, montmorillonitic, frigid)—45 percent
Fortank gravelly loam, 30 to 50 percent slopes (Xerollic Haplargids - fine, montmorillonitic, frigid)—45 percent
Contrasting inclusions as follows:
Inclusion 1: Fortank cobbly loam, 15 to 50 percent slopes (Xerollic Haplargids - fine, montmorillonitic, frigid)—4 percent
Inclusion 2: Xerollic Haplargids, deep to very deep, 15 to 50 percent slopes—2 percent
Inclusion 3: Xerollic Haplargids, 50 to 75 percent slopes—2 percent
Inclusion 4: Rock outcrop—2 percent

Fortank, Moderately Steep, Soil

Positions on landscape: Upper side slopes of mountains
Parent material: Kind—residuum; source—andesite, rhyolite, quartzite
Slope features: Length—long; shape—convex
Dominant present vegetation: Big sagebrush, spiny hopsage, rabbitbrush, cheatgrass, bluegrass
Typical profile:
0 to 10 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-2, A-4
10 to 35 inches—gravelly clay, gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GL; estimated AASHTO classification - A-7
35 inches—weathered bedrock
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 3.4 to 4.3 inches
Water supplying capacity: 7.5 to 9.5 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.20; T value—2; wind erodibility group—2
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Fortank, Steep, Soil

Positions on landscape: Middle and lower side slopes of mountains
Parent material: Kind—residuum; source—andesite, rhyolite, quartzite
Slope features: Length—long; shape—convex
Dominant present vegetation: Big sagebrush, spiny hopsage, rabbitbrush, cheatgrass, bluegrass
Typical profile:
0 to 10 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-2, A-4
10 to 35 inches—gravelly clay, gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, CL; estimated AASHTO classification - A-7
35 inches—weathered bedrock
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 3.4 to 4.3 inches
Water supplying capacity: 7.5 to 9.5 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.20; T value—2; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex side slopes of mountains; contrasting feature—cobbly upper layer; distinctive present vegetation—big sagebrush, spiny hopsage, rabbitbrush, cheatgrass, bluegrass

Inclusion 2: Position on landscape—concave side slopes of mountains; contrasting feature—bedrock at a depth of more than 40 inches; distinctive present vegetation—big sagebrush, rabbitbrush, bluebunch wheatgrass

Inclusion 3: Position on landscape—convex upper side slopes of mountains; contrasting features—slopes of 50 to 75 percent, lower water supplying capacity; distinctive present vegetation—big sagebrush, bluebunch wheatgrass, Thurber needlegrass

Inclusion 4: Position on landscapes—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at the surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 128)

Elements of Wildlife Habitat

Suitability of Fortank, moderately steep, soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Suitability of Fortank, steep, soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Fortank, Moderately Steep, Soil

Suitability and limitations for the following uses:

TABLE 128.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Fortank, moderately steep	Fortank, steep	1	2	3	4
Bluebunch wheatgrass	AGSP	10-40	10-40	20-30	15-25	10-40	---
Thurber needlegrass	STTH2	10-40	10-40	15-25	15-25	10-40	---
Basin wildrye	ELCI2	5-15	5-15	---	---	5-15	---
Indian ricegrass	ORHY	2-10	2-10	---	---	2-10	---
Webber ricegrass	ORWE	2-10	2-10	---	---	2-10	---
Bluegrass	POA++	2-10	2-10	---	---	2-10	---
Nevada bluegrass	PONE3	---	---	2-10	---	---	---
Other perennial grasses	PPGG	5-10	5-10	10-15	10-20	5-10	---
Perennial forbs	PPFF	5-10	5-10	2-5	5-15	5-10	---
Big sagebrush	ARTR2	10-15	10-15	10-15	5-10	10-15	---
Douglas rabbitbrush	CHVI8	---	---	5-10	---	---	---
Antelope bitterbrush	PUTR2	---	---	---	2-5	---	---
Other shrubs	SSSS	5-15	5-15	---	2-8	5-15	---
Range site symbol		025X019N	025X019N	025X014N	025X021N	025X019N	BARREN
Potential production (lb/acre):							
Favorable years		800	800	1,000	500	800	---
Normal years		600	600	800	400	600	---
Unfavorable years		400	400	600	250	400	---

Rangeland seeding: Fair—too arid, droughty
Roadfill: Poor—depth to rock, low strength
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Fortank, Steep, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty, erodes easily
Roadfill: Poor—depth to rock, low strength, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIe, nonirrigated
Range site symbol: 025X019N

881—Batan-Ocala association

Map Unit Setting

Positions on landscape: Alluvial flats, alluvial flat remnants
Elevation: 4,700 to 5,500 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Batan silt loam, 0 to 2 percent slopes (Durorthidic Torriorthents - fine-silty, mixed (calcareous), mesic)—35 percent
Ocala silty clay loam, occasionally flooded, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—25 percent
Ocala silty clay loam, rarely flooded, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—25 percent
Contrasting inclusions as follows:
Inclusion 1: Aquic Durorthidic Torriorthents, 0 to 2 percent slopes (Aquic Durorthidic Torriorthents - fine-silty, mixed (calcareous), mesic)—5 percent
Inclusion 2: Playas—5 percent
Inclusion 3: Xeric Torriorthents, 8 to 15 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), mesic—5 percent

Batan Soil

Positions on landscape: Remnants of alluvial flats
Parent material: Silty mixed alluvium high in content of pyroclastic material influenced by loess and volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, black greasewood, rabbitbrush, basin wildrye, Nuttall saltbush
Typical profile:
0 to 4 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 45); estimated Unified classification - ML; estimated AASHTO classification - A-4
4 to 60 inches or more—stratified fine sandy loam to silty clay; massive; slightly hard, friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 70); estimated Unified classification - CL; estimated AASHTO classification - A-6
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately slow
Available water capacity: 11.4 to 12.6 inches
Water supplying capacity: 5 to 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: Low

Ocala, Occasionally Flooded, Soil

Positions on landscape: Alluvial flats
Parent material: Silty alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Basin wildrye, alkali sacaton, black greasewood, inland saltgrass
Typical profile:
0 to 14 inches—silty clay loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic to moderately sodic (SAR 20 to 40); estimated Unified classification - CL; estimated AASHTO classification - A-7
14 to 60 inches or more—silt loam, silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML, CL; estimated AASHTO classification - A-6, A-7
Depth to seasonal high water table: In February through June—36 to 40 inches; rest of year—more than 40 inches
Hazard of flooding: Frequency—occasional; duration—long; months—March through June
Permeability: Slow
Available water capacity: 11.4 to 12.6 inches
Water supplying capacity: 9 to 10 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: High

Ocala, Rarely Flooded, Soil

Positions on landscape: Slightly higher hummocky parts of alluvial flats
Parent material: Silty alluvium influenced by volcanic ash

Slope features: Length—short; shape—convex
Dominant present vegetation: Black greasewood, basin wildrye, inland saltgrass
Typical profile:
0 to 3 inches—silty clay loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); moderately sodic to strongly sodic (SAR 30 to 50); estimated Unified classification - CL; estimated AASHTO classification - A-7
3 to 14 inches—silt loam, silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 9.0); slightly saline to moderately saline (4 to 16 mmhos/cm); moderately sodic to strongly sodic (SAR 30 to 50); estimated Unified classification - ML, CL; estimated AASHTO classification - A-6, A-7
14 to 60 inches or more—silt loam, silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML, CL; estimated AASHTO classification - A-6, A-7
Depth to seasonal high water table: In February through May—40 to 60 inches; rest of year—more than 60 inches
Hazard of flooding: Rare
Permeability: Slow
Available water capacity: 11.4 to 12.6 inches
Water supplying capacity: 6 to 8 inches
Runoff: Ponded
Hydrologic group: C
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—edges of alluvial flats adjacent to alluvial flat remnants; contrasting features—water table at a depth of 60 inches, nonsaline and nonsodic upper layer; distinctive present vegetation—basin wildrye, basin big sagebrush
Inclusion 2: Position on landscape—irregularly shaped sink areas adjacent to the lower part of alluvial flats; contrasting feature—impermeable upper layer; distinctive present vegetation—barren
Inclusion 3: Position on landscape—fan skirts on margins of alluvial flat remnants; contrasting features—well drained, nonsaline, loamy throughout the profile; distinctive present vegetation—big sagebrush, rabbitbrush, grasses

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 129)

Elements of Wildlife Habitat

Suitability of Batan soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Suitability of Ocala, occasionally flooded, soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—fair
Suitability of Ocala, rarely flooded, soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—fair

Ratings for Selected Uses

Batan Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Poor—low strength
Daily cover for landfill: Good
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Ocala, Occasionally Flooded, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Poor—low strength
Daily cover for landfill: Poor—excess salt, excess sodium
Shallow excavations: Moderate—wetness, flooding
Local roads and streets: Severe—low strength, flooding, frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess sodium, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 129.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Batan	Ocala, occasionally flooded	Ocala, rarely flooded	1	2	3
Bottlebrush squirreltail	SIHY	7-10	---	---	2-5	---	2-5
Inland saltgrass	DIST	T-2	5-10	5-10	2-5	---	---
Basin wildrye	ELCI2	T-2	40-60	5-15	50-60	---	---
Alkali sacaton	SPAI	---	15-30	---	---	---	---
Western wheatgrass	AGSM	---	---	---	5-10	---	---
Mat muhly	MURI	---	---	---	2-5	---	---
Thurber needlegrass	STTH2	---	---	---	---	---	20-30
Bluebunch wheatgrass	AGSP	---	---	---	---	---	5-10
Indian ricegrass	ORHY	---	---	---	---	---	2-5
Pine bluegrass	POSC	---	---	---	---	---	2-5
Other perennial grasses	PPGG	---	2-4	T-4	2-5	---	2-10
Miterwort	NITRO	2-3	---	---	---	---	---
Povertyweed	IVAX	---	1-2	---	1-2	---	---
Globemallow	SPHAE	---	---	---	---	---	2-3
Other perennial forbs	PPFF	T-3	2-4	T-4	2-3	---	5-10
Shadscale	ATCO	30-40	---	---	---	---	---
Bud sagebrush	ARSP5	5-10	---	---	---	---	---
Black greasewood	SAVE4	20-30	5-15	60-75	2-5	---	---
Seepweed	SUAED	5-15	---	---	---	---	---
Rubber rabbitbrush	CHNA2	---	2-5	---	2-5	---	---
Basin big sagebrush	ARTRT*	---	---	---	15-20	---	---
Wyoming big sagebrush	ARTRW*	---	---	---	---	---	15-20
Downy rabbitbrush	CHVIP	---	---	---	---	---	2-5
Other shrubs	SSSS	---	2-5	5-10	2-4	---	2-8

Range site symbol	024X003N	024X007N	024X011N	024X006N	BARREN	024X005N
Potential production (lb/acre):						
Favorable years	600	1,900	500	1,500	---	800
Normal years	450	1,400	350	1,100	---	600
Unfavorable years	300	800	200	600	---	400

Ocala, Rarely Flooded, Soil

Suitability and limitations for the following uses:

Rangeland seeding: Poor—too arid, excess salt, excess sodium

Roadfill: Poor—low strength

Daily cover for landfill: Poor—excess salt, excess sodium

Shallow excavations: Moderate—wetness

Local roads and streets: Severe—low strength, frost action

Pond reservoir areas: Slight

Embankments, dikes, and levees: Severe—excess sodium, excess salt

Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Batan soil—IIIs, irrigated, and VIIs, nonirrigated; Ocala, occasionally flooded, soil—

IVw, irrigated, and VIIw, nonirrigated; Ocala, rarely flooded, soil—IVw, nonirrigated

Range site symbol: Batan soil—024X003N; Ocala, occasionally flooded, soil—024X007N; Ocala, rarely flooded, soil—024X011N

883—Batan silt loam

Map Unit Setting

Positions on landscape: Remnants of alluvial flats
Elevation: 5,000 to 5,700 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 49 degrees F
Frost-free season—about 110 days

Composition

Batan silt loam, 0 to 2 percent slopes (Durorthidic Torriorthents - fine-silty, mixed (calcareous), mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Typic Torriorthents, 2 to 4 percent slopes—10 percent
Inclusion 2: Aquic Torriorthents, 0 to 2 percent slopes—5 percent

Batan Soil

Positions on landscape: Remnants of alluvial flats
Parent material: Mixed alluvium that is high in content of pyroclastic material and loess influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, black greasewood, bottlebrush squirreltail
Typical profile:
0 to 4 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 45); estimated Unified classification - ML; estimated AASHTO classification - A-4
4 to 60 inches or more—stratified fine sandy loam to silty clay; massive; slightly hard, friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 70); estimated Unified classification - CL; estimated AASHTO classification - A-6
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately slow
Available water capacity: 11.4 to 12.6 inches
Water supplying capacity: 5 to 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth fan skirts along the upper margins of alluvial flat remnants; contrasting features—well drained, does not have a layer of weak silica cementation; distinctive present vegetation—shadscale, black greasewood, bottlebrush squirreltail
Inclusion 2: Position on landscape—alluvial flats along the lower part of alluvial flat remnants; contrasting feature—water table at a depth of 20 to 40 inches; distinctive present vegetation—rabbitbrush, basin wildrye, alkali sacaton

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 130)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—fair
Shallow water areas—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Poor—low strength
Daily cover for landfill: Good
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIIs, irrigated, and VIIs, nonirrigated
Range site symbol: 024X003N

TABLE 130.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Batan	1	2
Bottlebrush squirreltail	SIHY	7-10	2-5	---
Inland saltgrass	DIST	T-2	---	5-10
Basin wildrye	ELCI2	T-2	5-10	40-60
Indian ricegrass	ORHY	---	2-5	---
Alkali sacaton	SPAI	---	---	15-30
Other perennial grasses	PPGG	---	2-5	2-4
Miterwort	NITRO	2-3	---	---
Thelypody	THELY	---	2-4	---
Globemallow	SPHAE	---	1-2	---
Povertyweed	IVAX	---	---	1-2
Other perennial forbs	PPFF	T-3	1-2	2-4
Shadscale	ATCO	30-40	---	---
Bud sagebrush	ARSP5	5-10	---	---
Black greasewood	SAVE4	20-30	20-30	5-15
Seepweed	SUAED	5-15	---	---
Basin big sagebrush	ARTRT*	---	10-25	---
Spiny hopsage	GRSP	---	5-15	---
Rubber rabbitbrush	CHNA2	---	---	2-5
Other shrubs	SSSS	---	2-10	2-5
Range site symbol		024X003N	024X022N	024X007N
Potential production (lb/acre):				
Favorable years		600	800	1,900
Normal years		450	600	1,400
Unfavorable years		300	350	800

891—Whitepeak-Quarz-Softscrabble Variant association

Map Unit Setting

Positions on landscape: Lower crests and side slopes of mountains
Elevation: 6,500 to 7,500 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Whitepeak very stony loam, 2 to 8 percent slopes (Xerollic Haplargids - clayey-skeletal, montmorillonitic, frigid)—35 percent
Quarz stony loam, 15 to 30 percent slopes (Aridic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—25 percent
Softscrabble loam, 4 to 8 percent slopes (Pachic Argixerolls - loamy-skeletal, mixed, frigid)—25 percent
Contrasting inclusions as follows:
Inclusion 1: Welch loam, drained, 4 to 8 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—5 percent
Inclusion 2: Xerollic Haplargids, 15 to 30 percent slopes—5 percent
Inclusion 3: Xerollic Camborthids, 2 to 8 percent slopes—5 percent

Whitepeak Soil

Positions on landscape: Lower crests and upper side slopes of mountains
Parent material: Kind—residuum, colluvium; source—quartzite, andesite, rhyolite
Slope features: Length—long; shape—smooth to convex
Dominant present vegetation: Low sagebrush, Sandberg bluegrass, small rabbitbrush, Indian ricegrass
Typical profile:
0 to 3 inches—very stony loam; 15 to 30 percent cobbles and stones and 20 to 40 percent pebbles (by weight); platy structure; hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, SC; estimated AASHTO classification - A-4, A-6
3 to 23 inches—extremely stony clay, very cobbly clay; 50 to 75 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; very hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC, CH; estimated AASHTO classification - A-2, A-7
23 inches—unweathered bedrock
Range in depth to bedrock: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 1.1 to 1.7 inches
Water supplying capacity: 9 to 10 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.17; T value—2; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Quarz Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—sandstone, shale, quartzite
Slope features: Length—long; shape—smooth to convex
Dominant present vegetation: Big sagebrush, rabbitbrush, Sandberg bluegrass
Typical profile:
0 to 5 inches—stony loam; 25 to 30 percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL; estimated AASHTO classification - A-6
5 to 30 inches—very gravelly clay, very gravelly clay loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.6); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
30 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 2.7 to 3.2 inches
Water supplying capacity: 11 to 13 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.20; T value—2; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight

Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Softscrabble Soil

Positions on landscape: Lower side slopes of mountains adjacent to mountain valleys
Parent material: Kind—residuum, colluvium; source—volcanic rocks
Slope features: Length—short; shape—concave
Dominant present vegetation: Mountain big sagebrush, basin wildrye, rabbitbrush, serviceberry
Typical profile:
0 to 8 inches—loam; 0 to 25 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
8 to 14 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, CL-ML; estimated AASHTO classification - A-4
14 to 60 inches or more—very gravelly loam, very gravelly clay loam; 0 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Slow
Available water capacity: 6.1 to 7.4 inches
Water supplying capacity: 14 to 16 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.24; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—moderately wet, very deep; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 2: Position on landscape—convex eroded lower crests and upper side slopes of mountains; contrasting features—thin upper layer, deep to bedrock; distinctive present vegetation—bluebunch wheatgrass, big sagebrush
Inclusion 3: Position on landscape—inset fans of narrow mountain valleys; contrasting feature—does not have a layer of clay accumulation; distinctive present vegetation—big sagebrush, rabbitbrush, bluegrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 131)

Elements of Wildlife Habitat

Suitability of Whitepeak soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Quarz soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Softscrabble soil for named elements:
Grain and seed crops (irrigated)—poor;
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—good
Shrubs (nonirrigated)—good
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Whitepeak Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, rooting depth, small stones
Roadfill: Poor—depth to rock, large stones
Daily cover for landfill: Poor—depth to rock, too clayey, hard to pack
Shallow excavations: Severe—depth to rock, large stones
Local roads and streets: Severe—large stones
Pond reservoir areas: Moderate—slope, depth to rock
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Quarz Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty, large stones
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope

TABLE 131.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Whitepeak	Quarz	Softscrabble Variant	1	2	3
Bluebunch wheatgrass	AGSP	2-5	5-10	10-20	---	10-15	5-10
Indian ricegrass	ORHY	5-10	5-10	---	---	---	5-10
Thurber needlegrass	STTH2	5-10	20-30	5-10	---	5-10	20-30
Sandberg bluegrass	POSE	5-10	2-5	---	---	2-5	2-5
Bottlebrush squirreltail	SIHY	2-5	---	---	---	---	---
Needleandthread	STCO4	---	2-5	---	---	---	2-5
Pine bluegrass	POSC	---	2-5	2-5	---	---	2-5
Western wheatgrass	AGSM	---	1-2	1-5	5-10	1-4	1-2
Basin wildrye	ELCI2	---	---	2-5	30-50	5-10	---
Idaho fescue	FEID	---	---	2-5	---	---	---
Nevada bluegrass	PONE3	---	---	---	5-10	---	---
Other perennial grasses	PPGG	5-10	5-8	10-20	5-15	10-15	5-8
Tapertip hawksbeard	CRAC2	---	2-5	---	---	---	2-5
Arrowleaf balsamroot	BASA3	---	2-5	---	---	---	2-5
Lupine	LUPIN	---	2-5	---	---	---	2-5
White stoneseed	LIRU4	---	1-5	---	---	---	1-5
Other perennial forbs	PPFF	5-10	---	5-12	5-10	5-15	---
Annual forbs	AAFF	1-2	2-5	---	---	---	2-5
Low sagebrush	ARAR8	25-30	---	---	---	---	---
Big sagebrush	ARTR2	---	10-15	---	---	---	10-15
Rabbitbrush	CHRYS9	---	2-5	---	---	---	2-5
Antelope bitterbrush	PUTR2	---	1-10	5-10	---	2-8	1-10
Serviceberry	AMELA	---	---	2-10	---	3-10	---
Horsebrush	TETRA3	---	---	1-2	---	---	---
Mountain big sagebrush	ARTRV	---	---	15-25	1-2	15-25	---
Basin big sagebrush	ARTRT*	---	---	---	5-10	---	---
Rubber rabbitbrush	CHNA2	---	---	---	2-5	---	---
Other shrubs	SSSS	10-15	5-10	5-15	5-10	15-20	5-10

Range site symbol	028B045N	028B007N	028B030N	028B024N	028B027N	028B007N
Potential production (lb/acre):						
Favorable years	800	1,000	1,100	2,800	900	1,000
Normal years	600	800	800	1,700	600	800
Unfavorable years	400	600	600	1,000	300	600

Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Softscrabble Soil

Suitability and limitations for the following uses:
Rangeland seeding: Good
Roadfill: Good
Daily cover for landfill: Poor—small stones

Shallow excavations: Slight
Local roads and streets: Moderate—flooding, frost action
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Slight
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Whitepeak soil—VIIs, nonirrigated; Quarz soil—VIIs, nonirrigated; Softscrabble soil—IVe, irrigated, and VIc, nonirrigated
Range site symbol: Whitepeak soil—028B045N; Quarz soil—028B007N; Softscrabble soil—028B030N

901—Tenabo-Ricert association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 4,700 to 5,100 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 100 days

Composition

Tenabo gravelly very fine sandy loam, 0 to 4 percent slopes (Typic Nadurargids - loamy, mixed, mesic, shallow)—60 percent
Ricert gravelly silt loam, 2 to 4 percent slopes (Duric Natrargids - fine-loamy, mixed, mesic)—25 percent
Contrasting inclusions as follows:
Inclusion 1: Duric Camborthids, 0 to 4 percent slopes (Duric Camborthids - coarse-silty, mixed, mesic)—10 percent
Inclusion 2: Typic Camborthids, 0 to 4 percent slopes (Typic Camborthids - sandy-skeletal, mixed, mesic)—5 percent

Tenabo Soil

Positions on landscape: Summits of fan piedmonts
Parent material: Thin loess mantle that is high in content of volcanic ash over mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, mustard, cheatgrass
Typical profile:
0 to 5 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 40 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification - SM; estimated AASHTO classification - A-1, A-2
5 to 17 inches—silty clay loam, clay loam, gravelly clay loam; 10 to 30 percent pebbles (by weight); prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification - CL; estimated AASHTO classification - A-6
17 to 31 inches—indurated hardpan
31 to 50 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sand; 5 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 46); estimated Unified classification - GP-GM, GM; estimated AASHTO classification - A-1

Range in depth to hardpan: 15 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderately slow; below the hardpan—rapid
Available water capacity: 2.8 to 3.2 inches
Water supplying capacity: 4 to 6 inches
Runoff: Slow
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—1; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Ricert Soil

Positions on landscape: Dissected side slopes of fan piedmonts
Parent material: Loess over mixed alluvium
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Shadscale, bug sagebrush, mustard, cheatgrass
Typical profile:
0 to 5 inches—gravelly silt loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC; estimated AASHTO classification - A-4
5 to 14 inches—loam, clay loam; 0 to 15 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CL; estimated AASHTO classification - A-6, A-7
14 to 20 inches—loam, silt loam, clay loam; 0 to 5 percent cobbles and stones and 5 to 20 percent pebbles (by weight); massive; hard, firm; very strongly alkaline (pH 9.2); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CL; estimated AASHTO classification - A-6
20 to 60 inches or more—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly loamy sand; 0 to 15 percent cobbles and stones and 50 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - GM, GP-GM; estimated AASHTO classification - A-1

Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 14 inches—moderately slow; below this depth—moderately rapid
Available water capacity: 4.5 to 7.0 inches
Water supplying capacity: 5 to 8 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—3; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—margins of inset fans; contrasting features—silt loam throughout the profile, does not have an indurated hardpan; distinctive present vegetation—shadscale, bud sagebrush, bottlebrush squirreltail
Inclusion 2: Position on landscape—adjacent to channels on inset fans; contrasting features—very gravelly sand throughout the profile, does not have an indurated hardpan; distinctive present vegetation—shadscale, bud sagebrush, bottlebrush squirreltail

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 132)

Elements of Wildlife Habitat

Suitability of Tenabo soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor
Suitability of Ricert soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

TABLE 132.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Tenabo	Ricert	1	2
Indian ricegrass	ORHY	5-15	5-15	5-15	5-15
Bottlebrush squirreltail	SIHY	5-10	5-10	5-10	5-10
Bluegrass	POA++	2-5	2-5	2-5	2-5
Globemallow	SPHAE	2-3	2-3	2-3	2-3
Other perennial forbs	PPFF	2-4	2-4	2-4	2-4
Shadscale	ATCO	30-35	30-35	30-35	30-35
Bud sagebrush	ARSP5	25-30	25-30	25-30	25-30
Other shrubs	SSSS	2-5	2-5	2-5	2-5
Range site symbol		024X002N	024X002N	024X002N	024X002N
Potential production (lb/acre):					
Favorable years		700	700	700	700
Normal years		450	450	450	450
Unfavorable years		300	300	300	300

Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Tenabo Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess sodium
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan, seepage, too sandy
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—cemented pan
Pond reservoir areas: Severe—seepage, cemented pan
Embankments, dikes, and levees: Severe—seepage, excess salt
Sand: Probable source
Gravel: Probable source

Ricert Soil

Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess sodium
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: IVe, irrigated, and VIIs, nonirrigated
Range site symbol: 024X002N

922—Handy loam, 2 to 8 percent slopes

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 6,200 to 7,000 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Handy loam, 2 to 8 percent slopes (Xerollic Haplargids - fine, montmorillonitic, frigid)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Welch loam, drained, 0 to 2 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—8 percent
Inclusion 2: Fertaline gravelly loam, 4 to 15 percent slopes (Abruptic Xerollic Durargids - fine, montmorillonitic, frigid)—4 percent
Inclusion 3: Jesse Camp silt loam, 0 to 2 percent slopes (Xerollic Camborthids - fine-silty, mixed, frigid)—3 percent

Handy Soil

Positions on landscape: Summits of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—plane to convex
Dominant present vegetation: Big sagebrush, Indian ricegrass, bottlebrush squirreltail, cheatgrass
Typical profile:
0 to 9 inches—loam; 0 to 5 percent cobbles and stones and 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML, CL, ML; estimated AASHTO classification - A-4, A-6
9 to 21 inches—gravelly clay, clay; 0 to 5 percent cobbles and stones and 0 to 40 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CH, CL; estimated AASHTO classification - A-7
21 to 60 inches or more—stratified gravelly loam to very gravelly loamy sand; 0 to 5 percent cobbles and stones and 40 to 70 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2

Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 6.0 to 7.4 inches
Water supplying capacity: 10 to 12 inches
Runoff: Slow to medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.32; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—adjacent to entrenched channels on inset fans; contrasting features—thick dark-colored upper layer, does not have a layer of clay accumulation; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 2: Position on landscape—smooth upper part of fan piedmont remnants; contrasting feature—indurated hardpan at a depth of 20 to 40 inches; distinctive present vegetation—low sagebrush, Indian ricegrass
Inclusion 3: Position on landscape—lower part of inset fans; contrasting feature—silty throughout the profile, does not have a layer of clay accumulation; distinctive present vegetation—basin big sagebrush, basin wildrye

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 133)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—rooting depth
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 133.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Handy	1	2	3
Bluebunch wheatgrass	AGSP	20-30	---	---	2-5
Thurber needlegrass	STTH2	15-25	---	---	5-10
Nevada bluegrass	PONE3	2-10	5-10	2-5	---
Basin wildrye	ELCI2	---	30-50	30-50	---
Western wheatgrass	AGSM	---	5-10	---	---
Wheatgrass	AGROP2	---	---	2-5	---
Indian ricegrass	ORHY	---	---	---	5-10
Sandberg bluegrass	POSE	---	---	---	5-10
Bottlebrush squirreltail	SIHY	---	---	---	2-5
Other perennial grasses	PPGG	10-15	5-15	15-25	5-10
Perennial forbs	PPFF	2-5	5-10	2-5	5-10
Annual forbs	AAFF	---	---	---	1-2
Big sagebrush	ARTR2	10-15	---	---	---
Douglas rabbitbrush	CHVI8	5-10	---	---	---
Basin big sagebrush	ARTRT*	---	5-10	5-10	---
Mountain big sagebrush	ARTRV	---	1-2	---	---
Rubber rabbitbrush	CHNA2	---	2-5	---	---
Wyoming big sagebrush	ARTRW*	---	---	1-2	---
Low sagebrush	ARAR8	---	---	---	25-30
Other shrubs	SSSS	---	5-10	5-8	10-15

Range site symbol	025X014N	028B024N	028B003N	028B045N
Potential production (lb/acre):				
Favorable years	1,000	2,800	2,600	800
Normal years	800	1,700	1,250	600
Unfavorable years	600	1,000	800	400

Interpretive Groups

Range site symbol: 025X014N

Capability classification: VIIc, irrigated

923—Handy-Rubyhill association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 5,700 to 6,300 feet
Climatic data (average annual):
Precipitation—about 11 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Handy loam, 4 to 15 percent slopes (Xerollic Haplargids - fine, montmorillonitic, frigid)—55 percent
Rubyhill sandy loam, 2 to 8 percent slopes (Haploxerollic Durorthids - fine-loamy, mixed, frigid)—30 percent
Contrasting inclusions as follows:
Inclusion 1: Jesse Camp silt loam (Xerollic Camborthids - fine-silty, mixed, frigid)—10 percent
Inclusion 2: Aridic Haploxerolls, 2 to 8 percent slopes—5 percent

Handy Soil

Positions on landscape: Higher summits of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—plane to convex
Dominant present vegetation: Big sagebrush, Indian ricegrass, bottlebrush squirreltail, cheatgrass
Typical profile:
0 to 9 inches—loam; 0 to 5 percent cobbles and stones and 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML, CL, ML; estimated AASHTO classification - A-4, A-6
9 to 21 inches—gravelly clay, clay; 0 to 5 percent cobbles and stones and 0 to 40 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CH, CL; estimated AASHTO classification - A-7
21 to 60 inches or more—stratified gravelly loam to very gravelly loamy sand; 0 to 5 percent cobbles and stones and 40 to 70 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 6.0 to 7.4 inches
Water supplying capacity: 10 to 12 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.32; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Rubyhill Soil

Positions on landscape: Slightly dissected lower fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth to slightly convex
Dominant present vegetation: Wyoming big sagebrush, Indian ricegrass, rabbitbrush
Typical profile:
0 to 3 inches—sandy loam; 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-2, A-4
3 to 21 inches—loam, clay loam, gravelly loam; 10 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, CL, GC; estimated AASHTO classification - A-6
21 to 60 inches—cemented hardpan
Range in depth to hardpan: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 3.2 to 3.8 inches
Water supplying capacity: 7 to 9 inches
Runoff: Slow to medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—narrow, shallow inset fans on fan piedmont remnants; contrasting features—silt loam throughout the profile, does not

have a strongly silica-cemented hardpan, does not have a layer of clay accumulation; distinctive present vegetation—basin big sagebrush, basin wildrye

Inclusion 2: Position on landscape—foot slopes of fan piedmont remnants adjacent to inset fans; contrasting features—does not have a strongly silica-cemented hardpan, does not have a layer of clay accumulation; distinctive present vegetation—basin big sagebrush, basin wildrye

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 134)

Elements of Wildlife Habitat

Suitability of Handy soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Suitability of Rubyhill soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Handy Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—rooting depth
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Rubyhill Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Moderate—cemented pan, frost action
Pond reservoir areas: Moderate—seepage, cemented pan, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Handy soil—VIIc, nonirrigated; Rubyhill soil—IVe, irrigated, and VIIs, nonirrigated
Range site symbol: Handy soil—025X014N; Rubyhill soil—028B010N

TABLE 134.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Handy	Rubyhill	1	2
Bluebunch wheatgrass	AGSP	20-30	---	---	5-10
Thurber needlegrass	STTH2	15-25	---	---	20-30
Nevada bluegrass	PONE3	2-10	---	2-5	---
Indian ricegrass	ORHY	---	20-30	---	5-10
Needleandthread	STCO4	---	10-20	---	2-5
Bottlebrush squirreltail	SIHY	---	5-10	---	---
Sandberg bluegrass	POSE	---	2-5	---	2-5
Basin wildrye	ELCI2	---	---	30-50	---
Wheatgrass	AGROP2	---	---	2-5	---
Pine bluegrass	POSC	---	---	---	2-5
Western wheatgrass	AGSM	---	---	---	1-2
Other perennial grasses	PPGG	10-15	5-10	15-25	5-8
Tapertip hawksbeard	CRAC2	---	---	---	2-5
Arrowleaf balsamroot	BASA3	---	---	---	2-5
Lupine	LUPIN	---	---	---	2-5
White stoneseed	LIRU4	---	---	---	1-5
Other perennial forbs	PPFF	2-5	2-5	2-5	---
Annual forbs	AAFF	---	---	---	2-5
Big sagebrush	ARTR2	10-15	---	---	10-15
Douglas rabbitbrush	CHVI8	5-10	---	---	---
Wyoming big sagebrush	ARTRW*	---	15-20	1-2	---
Basin big sagebrush	ARTRT*	---	---	5-10	---
Rabbitbrush	CHRYS9	---	---	---	2-5
Antelope bitterbrush	PUTR2	---	---	---	1-10
Other shrubs	SSSS	---	5-10	5-8	5-10

Range site symbol	025X014N	028B010N	028B003N	028B007N
Potential production (lb/acre):				
Favorable years	1,000	800	2,600	1,000
Normal years	800	600	1,250	800
Unfavorable years	600	400	800	600

941—Short Creek association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 5,400 to 6,000 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 44 degrees F
Frost-free season—about 90 days

Composition

Short Creek gravelly clay loam, 30 to 50 percent slopes (Xerollic Haplargids - clayey-skeletal, montmorillonitic, frigid)—50 percent
Short Creek gravelly clay loam, 50 to 75 percent slopes (Xerollic Haplargids - clayey-skeletal, montmorillonitic, frigid)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Ramires loam, 15 to 30 percent slopes (Aridic Calcic Argixerolls - fine, montmorillonitic, frigid)—5 percent
Inclusion 2: Enko loam, 4 to 15 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, mesic)—5 percent

Short Creek, Steep, Soil

Positions on landscape: Severely dissected south-facing side slopes of fan piedmonts
Parent material: Mixed alluvium
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Big sagebrush, littleleaf horsebrush, Sandberg bluegrass, rabbitbrush
Typical profile:
0 to 4 inches—gravelly clay loam; 0 to 15 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC, SC; estimated AASHTO classification - A-6
4 to 38 inches—very gravelly clay; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
38 to 60 inches or more—extremely gravelly sandy clay, extremely gravelly clay loam, extremely gravelly sandy clay loam; 0 to 15 percent cobbles and stones and 75 to 85 percent pebbles (by weight); massive; hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GP-GC, GC; estimated AASHTO classification - A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 4.5 to 5.7 inches
Water supplying capacity: 9 to 10 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.24; T value—5; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Short Creek, Very Steep, Soil

Positions on landscape: Severely dissected north-facing side slopes of fan piedmonts
Parent material: Mixed alluvium
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Big sagebrush, littleleaf horsebrush, Sandberg bluegrass, rabbitbrush
Typical profile:
0 to 4 inches—gravelly clay loam; 0 to 15 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC, SC; estimated AASHTO classification - A-6
4 to 38 inches—gravelly clay; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
38 to 60 inches or more—extremely gravelly sandy clay, extremely gravelly clay loam, extremely gravelly sandy clay loam; 0 to 15 percent cobbles and stones and 75 to 85 percent pebbles (by weight); massive; hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GP-GC, GC; estimated AASHTO classification - A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 4.5 to 5.7 inches

Water supplying capacity: 9 to 10 inches
Runoff: Very rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.24; T value—5; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—north-facing foot slopes of adjacent mountains; contrasting features—slopes of 15 to 30 percent, less than 35 percent pebbles throughout the profile, thick and dark-colored upper layer; distinctive present vegetation—big sagebrush, Thurber needlegrass, bluebunch wheatgrass
Inclusion 2: Position on landscape—inset fans; contrasting features—slopes of 4 to 15 percent, does not have a layer of clay accumulation; distinctive present vegetation—big sagebrush, Thurber needlegrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 135)

Elements of Wildlife Habitat

Suitability for named elements on the Short Creek soils:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Short Creek, Steep, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—slope
Daily cover for landfill: Poor—slope, small stones
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Slight
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Short Creek, Very Steep, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—slope
Daily cover for landfill: Poor—slope, small stones
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Slight
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIe, nonirrigated
Range site symbol: Short Creek, steep, soil—025X015N; Short Creek, very steep, soil—024X033N

TABLE 135.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Short Creek, steep	Short Creek, very steep	1	2
Bluebunch wheatgrass	AGSP	40-80	2-5	20-30	10-40
Thurber needlegrass	STTH2	5-15	---	15-25	10-40
Basin wildrye	ELCI2	2-5	2-5	---	5-15
Indian ricegrass	ORHY	2-5	---	---	2-10
Idaho fescue	FEID	---	50-70	---	---
Cusick bluegrass	POCU3	---	2-10	---	---
Pine bluegrass	POSC	---	2-10	---	---
Nevada bluegrass	PONE3	---	---	2-10	---
Webber ricegrass	ORWE	---	---	---	2-10
Bluegrass	POA++	---	---	---	2-10
Other perennial grasses	PPGG	2-10	2-5	10-15	5-10
Tapertip hawksbeard	CRAC2	2-5	2-5	---	---
Balsamroot	BALSA	---	2-5	---	---
Other perennial forbs	PPFF	2-10	2-10	2-5	5-10
Big sagebrush	ARTR2	2-10	5-10	10-15	10-15
Antelope bitterbrush	PUTR2	T-10	---	---	---
Rabbitbrush	CHRYS9	---	2-5	---	---
Douglas rabbitbrush	CHVI8	---	---	5-10	---
Other shrubs	SSSS	2-8	T-5	---	5-15
Range site symbol		025X015N	024X033N	025X014N	025X019N
Potential production (lb/acre):					
Favorable years		1,000	800	1,000	800
Normal years		700	600	800	600
Unfavorable years		500	400	600	400

951—Donna-Stampede association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 5,600 to 6,500 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 90 days

Composition

Donna gravelly loam, 2 to 8 percent slopes (Abruptic Aridic Durixerolls - very-fine, montmorillonitic, frigid)—45 percent
Stampede gravelly loam, 4 to 15 percent slopes (Aridic Durixerolls - fine, montmorillonitic, frigid)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Haplargids, 30 to 50 percent slopes (Xerollic Haplargids - clayey-skeletal, montmorillonitic, frigid)—5 percent
Inclusion 2: Aridic Argixerolls, 15 to 30 percent slopes (Aridic Argixerolls - fine-loamy, mixed, frigid)—5 percent
Inclusion 3: Aridic Durixerolls, very cobbly, 8 to 15 percent slopes (Aridic Durixerolls - fine, montmorillonitic, frigid)—5 percent

Donna Soil

Positions on landscape: Summits of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—concave
Dominant present vegetation: Low sagebrush, rabbitbrush, mustard, cheatgrass, bluegrass
Typical profile:
0 to 10 inches—gravelly loam; 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL; estimated AASHTO classification - A-6
10 to 29 inches—clay; 15 to 25 percent pebbles (by weight); prismatic structure; very hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CH; estimated AASHTO classification - A-7
29 to 35 inches—indurated hardpan
Range in depth to hardpan: 20 to 32 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—very slow
Available water capacity: 4.5 to 5.0 inches
Water supplying capacity: 9 to 10 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.37; T value—2; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Stampede Soil

Positions on landscape: Summits and side slopes of fan piedmont remnants
Parent material: Kind—alluvium; source—mixed rocks, primarily tuff
Slope features: Length—short; shape—convex
Dominant present vegetation: Mountain big sagebrush, rabbitbrush, basin wildrye, bottlebrush squirreltail, bluegrass
Typical profile:
0 to 11 inches—gravelly loam; 25 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, ML; estimated AASHTO classification - A-4, A-6
11 to 26 inches—clay; 0 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CH; estimated AASHTO classification - A-7
26 to 32 inches or more—indurated hardpan
Range in depth to hardpan: 22 to 32 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—very slow
Available water capacity: 4.0 to 4.6 inches
Water supplying capacity: 9 to 10 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.43; T value—2; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—dissected side slopes of fan piedmont remnants; contrasting features—slopes of 30 to 50 percent, thin and light-colored upper layer, does not have a silica-

cemented hardpan; distinctive present vegetation—big sagebrush, bluebunch wheatgrass

Inclusion 2: Position on landscape—north-facing lower side slopes of fan piedmont remnants; contrasting features—loamy throughout the profile, slopes of 15 to 30 percent, does not have a silica-cemented hardpan; distinctive present vegetation—big sagebrush, bluebunch wheatgrass

Inclusion 3: Position on landscape—north-facing upper side slopes of fan piedmont remnants; contrasting feature—very cobbly surface; distinctive present vegetation—low sagebrush, rabbitbrush, mustard, cheatgrass, bluegrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 136)

Elements of Wildlife Habitat

Suitability of Donna soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Suitability of Stampede soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

TABLE 136.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production(dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Donna	Stampede	1	2	3
Bluebunch wheatgrass	AGSP	15-40	20-30	40-80	20-30	15-40
Thurber needlegrass	STTH2	15-40	15-25	5-15	15-25	15-40
Webber ricegrass	ORWE	5-15	---	---	---	5-15
Pine bluegrass	POSC	2-10	---	---	---	2-10
Sandberg bluegrass	POSE	2-10	---	---	---	2-10
Bottlebrush squirreltail	SIHY	2-5	---	---	---	2-5
Basin wildrye	ELCI2	1-5	---	2-5	---	1-5
Idaho fescue	FEID	2-5	---	---	---	2-5
Nevada bluegrass	PONE3	---	2-10	---	2-10	---
Indian ricegrass	ORHY	---	---	2-5	---	---
Other perennial grasses	PPGG	---	10-15	2-10	10-15	---
Tapertip hawksbeard	CRAC2	---	---	2-5	---	---
Other perennial forbs	PPFF	5-10	2-5	2-10	2-5	5-10
Antelope bitterbrush	PUTR2	T-5	---	T-10	---	T-5
Douglas rabbitbrush	CHVI8	2-5	5-10	---	5-10	2-5
Low sagebrush	ARAR8	15-25	---	---	---	15-25
Big sagebrush	ARTR2	---	10-15	2-10	10-15	---
Other shrubs	SSSS	---	---	2-8	---	---
Range site symbol		025XO18N	025XO14N	025XO15N	025XO14N	025XO18N
Potential production (lb/acre):						
Favorable years		800	1,000	1,000	1,000	800
Normal years		600	800	700	800	600
Unfavorable years		400	600	500	600	400

Ratings for Selected Uses

Donna Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—rooting depth
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan, small stones
Shallow excavations: Severe—cemented pan
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Stampede Soil

Suitability and limitations for the following uses:
Rangeland seeding: Good
Roadfill: Poor—cemented pan, low strength, shrink-swell
Daily cover for landfill: Poor—cemented pan, too clayey, hard to pack
Shallow excavations: Severe—cemented pan
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Donna soil—VIIs, nonirrigated; Stampede soil—IVe, irrigated, and VIs, nonirrigated
Range site symbol: Donna soil—025X018N; Stampede soil—025X014N

961—Weigle-Pedoli Variant association

Map Unit Setting

Positions on landscape: Crests and upper side slopes of hills
Elevation: 5,700 to 6,700 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 80 days

Composition

Weigle gravelly loam, 15 to 30 percent slopes (Xerollic Durorthids - loamy, mixed, frigid, shallow)—45 percent
Pedoli Variant loam, 15 to 30 percent slopes (Xerollic Haplargids - fine-loamy, mixed, frigid)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Camborthids, 2 to 8 percent slopes—7 percent
Inclusion 2: Durixerollic Camborthids, 2 to 8 percent slopes—5 percent
Inclusion 3: Rock outcrop—3 percent

Weigle Soil

Positions on landscape: Crests and upper side slopes of hills
Parent material: Kind—residuum; source—calcareous shale and limestone
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, Indian ricegrass, needleandthread
Typical profile:
0 to 4 inches—gravelly loam; 25 to 50 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, SM; estimated AASHTO classification - A-2, A-4
4 to 7 inches—loam, gravelly loam; 10 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, SM; estimated AASHTO classification - A-2, A-4
7 to 10 inches—indurated hardpan
10 to 18 inches—extremely gravelly loam; 10 to 30 percent cobbles and stones and 75 to 85 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - G-M; estimated AASHTO classification - A-1
18 inches—unweathered bedrock
Range in depth to hardpan: 6 to 14 inches
Range in depth to bedrock: 15 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 0.8 to 1.1 inches
Water supplying capacity: 7 to 9 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—1; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Pedoli Variant Soil

Positions on landscape: Lower side slopes of hills
Parent material: Kind—residuum, colluvium; source—calcareous shale and limestone
Slope features: Length—long; shape—smooth to slightly convex
Dominant present vegetation: Black sagebrush, Indian ricegrass, needleandthread
Typical profile:
0 to 3 inches—loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4
3 to 11 inches—loam, gravelly loam; 15 to 40 percent pebbles (by weight); angular blocky structure; hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC, CL-ML; estimated AASHTO classification - A-4
11 to 21 inches—gravelly sandy loam; 40 to 50 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
21 to 26 inches—extremely gravelly sandy loam, very gravelly sandy loam; 50 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GP-GM, GM; estimated AASHTO classification - A-1, A-2
26 inches or more—weathered bedrock
Range in depth to bedrock: 20 to 36 inches

Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 2.4 to 2.9 inches
Water supplying capacity: 8 to 10 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.32; T value—2; wind erodibility group—5
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscapes—near channels of inset fans and narrow drainageways between hills; contrasting features—very deep, does not have a silica-cemented hardpan, does not have a layer of clay accumulation; distinctive present vegetation—big sagebrush, Indian ricegrass
Inclusion 2: Position on landscape—margins of inset fans, narrow drainageways of hills, lower side slopes of hills; contrasting features—very deep, layer of weak silica cementation, does not have a layer of clay accumulation; distinctive present vegetation—big sagebrush, Indian ricegrass
Inclusion 3: Position on landscape—convex crests and upper side slopes of hills; contrasting feature—exposed bedrock at soil surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 137)

Elements of Wildlife Habitat

Suitability of Weigle soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Pedoli Variant soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Weigle Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, cemented pan
Roadfill: Poor—cemented pan, depth to rock
Daily cover for landfill: Poor—cemented pan, depth to rock, small stones
Shallow excavations: Severe—depth to rock, cemented pan, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, cemented pan, slope
Embankments, dikes, and levees: Severe—seepage, thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Pedoli Variant Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Weigle soil—VIIs, nonirrigated; Pedoli Variant soil—VIIe, nonirrigated
Range site symbol: 028B016N

TABLE 137.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Weigle	Pedoli Variant	1	2	3
Indian ricegrass	ORHY	5-15	5-15	20-30	20-30	---
Needleandthread	STCO4	5-15	5-15	10-20	10-20	---
Pine bluegrass	POSC	2-5	2-5	---	---	---
Bluebunch wheatgrass	AGSP	1-3	1-3	---	---	---
Bottlebrush squirreltail	SIHY	---	---	5-10	5-10	---
Sandberg bluegrass	POSE	---	---	2-5	2-5	---
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	---
Perennial forbs	PPFF	5-15	5-15	2-5	2-5	---
Black sagebrush	ARARN	20-25	20-25	---	---	---
Fourwing saltbush	ATCA2	2-5	2-5	---	---	---
Bud sagebrush	ARSP5	2-5	2-5	---	---	---
Wyoming big sagebrush	ARTRW*	---	---	15-20	15-20	---
Other shrubs	SSSS	10-20	10-20	5-10	5-10	---
Range site symbol		028B016N	028B016N	028B010N	028B010N	BARREN
Potential production (lb/acre):						
Favorable years		500	500	800	800	---
Normal years		250	250	600	600	---
Unfavorable years		150	150	400	400	---

962—Weigle gravelly loam, 15 to 30 percent slopes

Map Unit Setting

Positions on landscape: Crests and side slopes of hills
Elevation: 5,700 to 6,700 feet
Climatic data (average annual):
Precipitation—about 10 inches
Air temperature—about 45 degrees F
Frost-free season—about 80 days

Composition

Weigle gravelly loam, 15 to 30 percent slopes (Xerollic Durorthids - loamy, mixed, frigid, shallow)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Xerollic Camborthids, 2 to 8 percent slopes—5 percent
Inclusion 2: Lithic Xeric Torriorthents, 8 to 50 percent slopes—5 percent
Inclusion 3: Rock outcrop—5 percent

Weigle Soil

Positions on landscape: Crests and side slopes of hills
Parent material: Kind—residuum; source—calcareous shale and limestone
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, Indian ricegrass, needleandthread
Typical profile:
0 to 4 inches—gravelly loam; 25 to 50 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, SM; estimated AASHTO classification - A-2, A-4
4 to 7 inches—loam, gravelly loam; 10 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, SM; estimated AASHTO classification - A-2, A-4
7 to 10 inches—indurated hardpan
10 to 18 inches—extremely gravelly loam; 10 to 30 percent cobbles and stones and 75 to 85 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - GM; estimated AASHTO classification - A-1
18 inches—unweathered bedrock
Range in depth to hardpan: 6 to 14 inches
Range in depth to bedrock: 15 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 0.8 to 1.1 inches
Water supplying capacity: 7 to 9 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—1; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans and narrow drainageways between hills; contrasting features—very deep, does not have a silica-cemented hardpan; distinctive present vegetation—Wyoming big sagebrush, Indian ricegrass
Inclusion 2: Position on landscape—concave to convex crests and upper side slopes of hills; contrasting features—shallow to hard bedrock, does not have a silica-cemented hardpan; distinctive present vegetation—Utah juniper, big sagebrush
Inclusion 3: Position on landscape—convex crests and upper side slopes of hills; contrasting feature—exposed bedrock at the surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 138)

Elements of Wildlife Habitat

Suitability for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, cemented pan
Roadfill: Poor—cemented pan, depth to rock
Daily cover for landfill: Poor—cemented pan, depth to rock, small stones
Shallow excavations: Severe—depth to rock, cemented pan, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, cemented pan, slope

TABLE 138.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Weigle	1	2	3
Indian ricegrass	ORHY	5-15	20-30	X	---
Needleandthread	STCO4	5-15	10-20	X	---
Pine bluebrass	POSC	2-5	---	---	---
Bluebunch wheatgrass	AGSP	1-3	---	X	---
Bottlebrush squirreltail	SIHY	---	5-10	---	---
Sandberg bluegrass	POSE	---	2-5	---	---
Thurber needlegrass	STTH2	---	---	X	---
Basin wildrye	ELCI2	---	---	X	---
Bluegrass	POA++	---	---	X	---
Other perennial grasses	PPGG	5-10	5-10	X	---
Tapertip hawksbeard	CRAC2	---	---	X	---
Other perennial forbs	PPFF	5-15	2-5	X	---
Black sagebrush	ARARN	20-25	---	---	---
Fourwing saltbush	ATCA2	2-5	---	---	---
Bud sagebrush	ARSP5	2-5	---	---	---
Wyoming big sagebrush	ARTRW*	---	15-20	X	---
Rabbitbrush	CHRYS9	---	---	X	---
Utah juniper	JUOS	---	---	X	---
Other shrubs	SSSS	10-20	5-10	X	---
Range site symbol		028B016N	028B010N	---	BARREN
Woodland site symbol		---	---	025X059N	---
Potential production (lb/acre):					
Favorable years		500	800	200	---
Normal years		250	600	150	---
Unfavorable years		150	400	100	---

Embankments, dikes, and levees: Severe—seepage, thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site symbol: 028B016N

971—Bregar-Fortank-Jivas association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 6,400 to 7,500 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Bregar very gravelly loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids - loamy-skeletal, mixed, frigid)—50 percent
Fortank gravelly loam, 15 to 30 percent slopes (Xerollic Haplargids - fine, montmorillonitic, frigid)—20 percent
Jivas gravelly loam, 8 to 30 percent slopes (Aridic Argixerolls - loamy-skeletal, mixed, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Rock outcrop—5 percent
Inclusion 2: Cumulic Haplaquolls, 2 to 4 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—3 percent
Inclusion 3: Cumulic Haplaquolls, drained, 2 to 4 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—2 percent

Bregar Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—andesite, quartzite, rhyolite
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, rabbitbrush, phlox, Thurber needlegrass, bluegrass
Typical profile:
0 to 6 inches—very gravelly loam; 10 to 20 percent cobbles and stones and 45 to 60 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2, A-4, A-6
6 to 11 inches—very gravelly sandy clay loam, extremely cobbly clay loam, very gravelly clay loam; 5 to 45 percent cobbles and stones and 65 to 75 percent pebbles (by weight); subangular blocky structure; hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
11 inches—unweathered bedrock
Range in depth to bedrock: 8 to 12 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 0.8 to 1.1 inches
Water supplying capacity: 9 to 10 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.17; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Fortank Soil

Positions on landscape: South- and east-facing side slopes of mountains
Parent material: Kind—residuum; source—andesite, rhyolite, quartzite
Slope features: Length—long; shape—convex
Dominant present vegetation: Big sagebrush, rabbitbrush, spiny hopsage, Thurber needlegrass, bluegrass
Typical profile:
0 to 10 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-2, A-4
10 to 35 inches—gravelly clay, gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GL; estimated AASHTO classification - A-7
35 inches—weathered bedrock
Range in depth to bedrock: 30 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 3.4 to 4.3 inches
Water supplying capacity: 7.5 to 9.5 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.20; T value—2; wind erodibility group—6

Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Jivas Soil

Positions on landscape: South-, east-, and west-facing side slopes of mountains
Parent material: Kind—colluvium, residuum; source—volcanic rock
Slope features: Length—short; shape—concave
Dominant present vegetation: Big sagebrush, rabbitbrush, lupine, balsamroot, bluegrass
Typical profile:
0 to 12 inches—gravelly loam; 25 to 50 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, CL-ML; estimated AASHTO classification - A-4
12 to 45 inches—extremely gravelly sandy clay loam, extremely gravelly loam; 0 to 10 percent cobbles and stones and 70 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GP-GC; estimated AASHTO classification - A-2
45 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 3.3 to 4.2 inches
Water supplying capacity: 12 to 13 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—3; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex crests side slopes of mountains; contrasting feature—exposed bedrock; distinctive present vegetation—barren
Inclusion 2: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, wet, thick and dark-colored upper layer; distinctive present vegetation—willows, tufted hairgrass
Inclusion 3: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, moderately wet, thick and dark-colored upper layer; distinctive present vegetation—basin big sagebrush, basin wildrye

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 139)

Elements of Wildlife Habitat

Suitability of Bregar soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Fortank soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Jivas soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Bregar Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Fortank Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty
Roadfill: Poor—depth to rock, low strength
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Jivas Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty, erodes easily

TABLE 139.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Bregar	Fortank	Jivas	1	2	3
Idaho fescue	FEID	10-30	---	2-5	---	---	---
Webber ricegrass	CRWE	5-10	2-10	---	---	---	---
Cusick bluegrass	POCU3	5-10	---	---	---	---	---
Sandberg bluegrass	POSE	5-10	---	---	---	---	---
Bluebunch wheatgrass	AGSP	2-5	10-40	30-50	---	---	---
Thurber needlegrass	STTH2	---	10-40	2-10	---	---	---
Basin wildrye	ELCI2	---	5-15	5-10	---	---	50-60
Indian ricegrass	ORHY	---	2-10	---	---	---	---
Bluegrass	POA++	---	2-10	---	---	---	---
Nevada bluegrass	PONE3	---	---	2-5	5-10	---	5-10
Tufted hairgrass	DECA5	---	---	---	30-60	---	---
Sedge	CAREX	---	---	---	5-10	---	1-5
Alpine timothy	PHAL2	---	---	---	5-10	---	---
Mat muhly	MURI	---	---	---	---	---	2-5
Other perennial grasses	PPGG	2-8	5-10	5-10	2-10	---	15-20
Goldenweed	HAPLO2	2-5	---	---	---	---	---
Phlox	PHLOX	2-5	---	---	---	---	---
Hawksbeard	CREPI	2-5	---	---	---	---	---
Lupine	LUPIN	---	---	2-5	---	---	2-5
Arrowleaf balsamroot	BASA3	---	---	2-5	---	---	---
Sierra clover	TRWO	---	---	---	2-5	---	---
Cinquefoil	POTEN	---	---	---	2-5	---	---
Other perennial forbs	PPFF	5-10	5-10	2-5	10-20	---	5-10
Black sagebrush	ARARN	5-10	---	---	---	---	---
Low sagebrush	ARAR8	5-15	---	---	---	---	---
Big sagebrush	ARTR2	---	10-15	---	---	---	---
Antelope bitterbrush	PUTR2	---	---	2-5	---	---	---
Mountain big sagebrush	ARTRV	---	---	5-10	---	---	---
Willow	SALIX	---	---	---	2-5	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	---	10-15
Rubber rabbitbrush	CHNA2	---	---	---	---	---	2-5
Other shrubs	SSSS	2-10	5-15	2-10	---	---	---

Range site symbol	025X024N	025X019N	025X009N	025X005N	BARREN	025X003N
Potential production (lb/acre):						
Favorable years	350	800	1,300	2,000	---	2,500
Normal years	250	600	900	1,700	---	1,900
Unfavorable years	150	400	700	1,000	---	1,200

Roadfill: Fair—depth to rock, thin layer, slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope

Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Bregar soil—VIIs, nonirrigated; Fortank soil—VIIe, nonirrigated; Jivas soil—VIIe, nonirrigated
Range site symbol: Bregar soil—025X024N; Fortank soil—025X019N; Jivas soil—025X009N

972—Bregar-Jivas-Duff association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 6,500 to 8,000 feet
Climatic data (average annual):
Precipitation—about 14 inches
Air temperature—about 43 degrees F
Frost-free season—about 80 days

Composition

Bregar very gravelly loam, 15 to 75 percent slopes (Lithic Xerollic Haplargids - loamy-skeletal, mixed, frigid)—55 percent
Jivas gravelly loam, 15 to 30 percent slopes (Aridic Argixerolls - loamy-skeletal, mixed, frigid)—20 percent
Duff gravelly loam, 30 to 75 percent slopes (Pachic Cryoborolls - fine-loamy, mixed)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Cumulic Haplaquolls, 2 to 4 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—4 percent
Inclusion 2: Cumulic Haplaquolls, drained, 2 to 4 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—4 percent
Inclusion 3: Rock outcrop—2 percent

Bregar Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—andesite, rhyolite, quartzite
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, rabbitbrush, phlox, Thurber needlegrass, bluegrass
Typical profile:
0 to 6 inches—very gravelly loam; 10 to 20 percent cobbles and stones and 45 to 60 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2, A-4, A-6
6 to 11 inches—very gravelly sandy clay loam, extremely cobbly clay loam, very gravelly clay loam; 5 to 45 percent cobbles and stones and 65 to 75 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
11 inches—unweathered bedrock
Range in depth to bedrock: 8 to 12 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 0.8 to 1.1 inches
Water supplying capacity: 9 to 10 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.17; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Jivas Soil

Positions on landscape: South-, east-, and west-facing side slopes of mountains
Parent material: Kind—colluvium, residuum; source—volcanic rocks
Slope features: Length—long; shape—concave
Dominant present vegetation: Big sagebrush, rabbitbrush, lupine, bluegrass, Thurber needlegrass
Typical profile:
0 to 12 inches—gravelly loam; 25 to 50 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, CL-ML; estimated AASHTO classification - A-4
12 to 45 inches—extremely gravelly sandy clay loam, extremely gravelly loam; 0 to 10 percent cobbles and stones and 70 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GP-GC; estimated AASHTO classification - A-2
45 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 3.3 to 4.2 inches
Water supplying capacity: 12 to 13 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.24; T value—3; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low

Potential frost action: Moderate

Duff Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—colluvium, residuum; source—andesite, rhyolite, quartz latite
Slope features: Length—long; shape—concave
Dominant present vegetation: Big sagebrush, antelope bitterbrush, lupine, Idaho fescue, basin wildrye, bluegrass
Typical profile:
0 to 7 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-4
7 to 57 inches—gravelly loam, gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC, CL-ML, CL; estimated AASHTO classification - A-4, A-6
57 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 5.7 to 7.4 inches
Water supplying capacity: 13 to 15 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.20; T value—3; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, wet; distinctive present vegetation—willow, tufted hairgrass
Inclusion 2: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, moderately wet; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 3: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 140)

Elements of Wildlife Habitat

Suitability of Bregar soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Jivas soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Duff soil for named elements:
Wild herbaceous plants (nonirrigated)—good
Shrubs (nonirrigated)—good

Ratings for Selected Uses

Bregar Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, small stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Jivas Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—droughty, erodes easily
Roadfill: Fair—depth to rock, thin layer, slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Duff Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—erodes easily
Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines

TABLE 140.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Bregar	Jivas	Duff	1	2	3
Idaho fescue	FEID	10-30	2-5	15-40	---	---	---
Webber ricegrass	ORWE	5-10	---	---	---	---	---
Cusick bluegrass	POCU3	5-10	---	---	---	---	---
Sandberg bluegrass	POSE	5-10	---	---	---	---	---
Bluebunch wheatgrass	AGSP	2-5	30-50	15-30	---	---	---
Basin wildrye	ELCI2	---	5-10	5-10	---	50-60	---
Nevada bluegrass	PONE3	---	2-5	2-5	5-10	5-10	---
Thurber needlegrass	STTH2	---	2-10	T-10	---	---	---
Tufted hairgrass	DECA5	---	---	---	30-60	---	---
Sedge	CAREX	---	---	---	5-10	1-5	---
Alpine timothy	PHAL2	---	---	---	5-10	---	---
Mat muhly	MURI	---	---	---	---	2-5	---
Other perennial grasses	PPGG	2-8	5-10	5-10	2-10	15-20	---
Goldenweed	HAPLO2	2-5	---	---	---	---	---
Phlox	PHLOX	2-5	---	---	---	---	---
Hawksbeard	CREPI	2-5	---	1-5	---	---	---
Lupine	LUPIN	---	2-5	---	---	2-5	---
Arrowleaf balsamroot	BASA3	---	2-5	5-10	---	---	---
Sierra clover	TRWO	---	---	---	2-5	---	---
Cinquefoil	POTEN	---	---	---	2-5	---	---
Other perennial forbs	PPFF	5-10	2-5	5-15	10-20	5-10	---
Black sagebrush	ARARN	5-10	---	---	---	---	---
Low sagebrush	ARAR8	5-15	---	---	---	---	---
Antelope bitterbrush	PUTR2	---	2-5	5-15	---	---	---
Mountain big sagebrush	ARTRV	---	5-10	10-15	---	---	---
Willow	SALIX	---	---	---	2-5	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	10-15	---
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5	---
Other shrubs	SSSS	2-10	2-10	5-15	---	---	---

Range site symbol	025X024N	025X009N	025X012N	025X005N	025X003N	BARREN
Potential production (lb/acre):						
Favorable years	350	1,300	1,200	2,000	2,500	---
Normal years	250	900	900	1,700	1,900	---
Unfavorable years	150	700	600	1,000	1,200	---

Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Bregar soil—VIIs, nonirrigated; Jivas soil—VIIe, nonirrigated; Duff soil—VIIe, nonirrigated

Range site symbol: Bregar soil—025X024N; Jivas soil—025X009N; Duff soil—025X012N

975—Bregar Variant-Hymas-Quarz association

Map Unit Setting

Positions on landscape: Mountains
Elevation: 6,400 to 7,100 feet
Climatic data (average annual):
Precipitation—about 13 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Bregar Variant very cobbly loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids - loamy-skeletal, mixed, frigid)—50 percent
Hymas cobbly loam, 15 to 50 percent slopes (Lithic Haploxerolls - loamy-skeletal, carbonatic, frigid)—20 percent
Quarz very gravelly loam, 15 to 50 percent slopes (Aridic Argixerolls - clayey-skeletal, montmorillonitic, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Cumulic Haplaquolls, 2 to 4 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—3 percent
Inclusion 2: Cumulic Haplaquolls, drained, 2 to 4 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—3 percent
Inclusion 3: Aridic Argixerolls, 15 to 30 percent slopes—2 percent
Inclusion 4: Rock outcrop—2 percent

Bregar Variant Soil

Positions on landscape: Crests and south-, east-, and west-facing side slopes of mountains
Parent material: Kind—colluvium over residuum; source—chert, shale, sandstone, greenstone
Slope features: Length—short; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, bluebunch wheatgrass
Typical profile:
0 to 5 inches—very cobbly loam; 25 to 30 percent cobbles and stones and 55 to 65 percent pebbles (by weight); granular structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2
5 to 19 inches—extremely cobbly clay loam, extremely cobbly sandy clay loam; 40 to 60 percent cobbles and stones and 65 to 90 percent pebbles (by weight); subangular blocky structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2
19 inches—unweathered bedrock
Range in depth to bedrock: 12 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately slow
Available water capacity: 0.5 to 0.9 inch
Water supplying capacity: 8 to 10 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.10; T value—1; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Hymas Soil

Positions on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum; source—limestone, calcareous shale
Slope features: Length—short; shape—smooth to concave
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush
Typical profile:
0 to 3 inches—cobbly loam; 15 to 35 percent cobbles and stones and 10 to 30 percent pebbles (by weight); granular structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML, GM, SM; estimated AASHTO classification - A-4
3 to 12 inches—very cobbly loam, extremely gravelly loam, extremely cobbly loam, very gravelly loam; 30 to 70 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2
12 inches—unweathered bedrock
Range in depth to bedrock: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 0.8 to 1.4 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: D

Erosion factors (upper layer): K value—0.32; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Quarz Soil

Positions on landscape: East- and west-facing side slopes of mountains
Parent material: Kind—residuum; source—sandstone, shale, quartzite
Slope features: Length—short; shape—concave
Dominant present vegetation: Big sagebrush, antelope bitterbrush, Nevada bluegrass
Typical profile:
0 to 5 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
5 to 30 inches—very gravelly clay loam, very gravelly clay; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
30 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—slow
Available water capacity: 2.5 to 3.1 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, very poorly drained, slopes of 2 to 4 percent; distinctive present vegetation—willow, tufted hairgrass
Inclusion 2: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, somewhat poorly drained, slopes of 2 to 4 percent; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 3: Position on landscape—lower colluvial side slopes of mountains; contrasting feature—bedrock at a depth of more than 30 inches; distinctive present vegetation—big sagebrush, Idaho fescue, bluebunch wheatgrass
Inclusion 4: Position on landscape—convex shoulders of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Major Uses

Rangeland, woodland, wildlife habitat

Potential Native Plant Community (Table 141)

Woodland

Bregar Variant Soil

Site index for common trees: Singleleaf pinyon—30; Utah juniper—30
Most important native understory plants: Big sagebrush, bluebunch wheatgrass, bluegrass

Hymas Soil

Site index for common trees: Singleleaf pinyon—40; Utah juniper—40
Most important native understory plants: Big sagebrush, bluebunch wheatgrass, bluegrass

Elements of Wildlife Habitat

Suitability of Bregar Variant soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Hymas soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Quarz soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Bregar Variant Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, large stones
Roadfill: Poor—depth to rock, large stones, slope
Daily cover for landfill: Poor—depth to rock, slope, small stones
Shallow excavations: Severe—depth to rock, large stones, slope

TABLE 141.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Bregar Variant	Hymas	Quarz	1	2	3	4
Indian ricegrass	ORHY	X	X	---	---	---	---	---
Needleandthread	STCO4	X	X	---	---	---	---	---
Pine bluegrass	POSC	X	X	---	---	---	1-2	---
Bluebunch wheatgrass	AGSP	X	X	30-50	---	---	15-40	---
Nevada bluegrass	PONE3	X	X	2-5	5-10	5-10	---	---
Thurber needlegrass	STTH2	X	X	2-10	---	---	---	---
Bottlebrush squirreltail	SIHY	X	X	---	---	---	---	---
Sandberg bluegrass	POSE	X	X	---	---	---	---	---
Basin wildrye	ELCI2	---	---	5-10	---	50-60	2-5	---
Idaho fescue	FEID	---	---	2-5	---	---	20-40	---
Tufted hairgrass	DECA5	---	---	---	30-60	---	---	---
Sedge	CAREX	---	---	---	5-10	1-5	---	---
Alpine timothy	PHAL2	---	---	---	5-10	---	---	---
Mat muhly	MURI	---	---	---	---	2-5	---	---
Other perennial grasses	PPGG	X	X	5-10	2-10	15-20	2-5	---
Lupine	LUPIN	---	---	2-5	---	2-5	2-5	---
Arrowleaf balsamroot	BASA3	---	---	2-5	---	---	2-5	---
Sierra clover	TRWO	---	---	---	2-5	---	---	---
Cinquefoil	POTEN	---	---	---	2-5	---	---	---
Other perennial forbs	PPFF	X	X	2-5	10-20	5-10	2-10	---
Big sagebrush	ARTR2	X	X	---	---	---	5-15	---
Utah juniper	JUOS	X	X	---	---	---	---	---
Singleleaf pinyon	PIMO	X	X	---	---	---	---	---
Antelope bitterbrush	PUTR2	---	---	2-5	---	---	---	---
Mountain big sagebrush	ARTRV	---	---	5-10	---	---	---	---
Willow	SALIX	---	---	---	2-5	---	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	10-15	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	2-5	---	---
Rabbitbrush	CHRYS9	---	---	---	---	---	2-5	---
Other shrubs	SSSS	X	X	2-10	---	---	---	---
Range site symbol		---	---	025X009N	025X005N	025X003N	025X027N	BARREN
Woodland site symbol		025X062N	025X062N	---	---	---	---	---
Potential production (lb/acre):								
Favorable years		500	500	1,300	2,000	2,500	1,300	---
Normal years		300	300	900	1,700	1,900	900	---
Unfavorable years		250	250	700	1,000	1,200	600	---

Local roads and streets: Severe—depth to rock, large stones, slope

Pond reservoir areas: Severe—depth to rock, slope

Embankments, dikes, and levees: Severe—large stones, thin layer

Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Hymas Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, erodes easily
Roadfill: Poor—depth to rock, large stones, slope
Daily cover for landfill: Poor—depth to rock, large stones, slope
Shallow excavations: Severe—depth to rock, large stones, slope
Local roads and streets: Severe—depth to rock, slope, large stones
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Quarz Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Bregar Variant soil—VIIs, nonirrigated; Hymas soil—VIIe, nonirrigated; Quarz soil—VIIs, nonirrigated
Woodland suitability group: Bregar Variant soil—3r; Hymas soil—3r
Range site symbol: Quarz soil—025X009N

981—Ebic-Ziram-Jivas association, moderately steep

Map Unit Setting

Positions on landscape: Mountains
Elevation: 6,500 to 8,100 feet
Climatic data (average annual):
Precipitation—about 13 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Ebic very stony clay loam, 15 to 30 percent slopes (Typic Palexerolls - clayey-skeletal, montmorillonitic, frigid)—35 percent
Ziram very cobbly clay loam, 15 to 30 percent slopes (Typic Palexerolls - clayey-skeletal, montmorillonitic, frigid)—35 percent
Jivas cobbly loam, 15 to 30 percent slopes (Aridic Argixerolls - loamy-skeletal, mixed, frigid)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Lithic Xerollic Haplargids, 15 to 30 percent slopes (Lithic Xerollic Haplargids - clayey, montmorillonitic, frigid)—4 percent
Inclusion 2: Cumulic Haplaquolls, 2 to 4 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—4 percent
Inclusion 3: Cumulic Haplaquolls, drained, 2 to 4 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—4 percent
Inclusion 4: Rock outcrop—3 percent

Ebic Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—quartz latite, andesitic tuff
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush, Nevada bluegrass, Thurber needlegrass
Typical profile:
0 to 9 inches—very stony clay loam; 25 to 40 percent cobbles and stones and 30 to 55 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC, SC; estimated AASHTO classification - A-6
9 to 23 inches—very cobbly clay, extremely cobbly clay; 30 to 45 percent cobbles and stones and 45 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC, SC; estimated AASHTO classification - A-2
23 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 1.7 to 2.3 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Ziram Soil

Positions on landscape: Middle and lower side slopes of mountains
Parent material: Kind—residuum, colluvium; source—tuff, tuffaceous sandstone
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush, bluegrass, bottlebrush squirreltail
Typical profile:
0 to 7 inches—very cobbly clay loam; 30 to 65 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC, SC; estimated AASHTO classification - A-2, A-6, A-7
7 to 23 inches—very gravelly clay; 15 to 25 percent cobbles and stones and 35 to 55 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
23 to 42 inches—very cobbly clay, extremely cobbly clay; 50 to 70 percent cobbles and stones and 30 to 55 percent pebbles (by weight); prismatic structure; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
42 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None

Permeability: Above the bedrock—very slow
Available water capacity: 2.4 to 3.5 inches
Water supplying capacity: 11 to 12 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.15; T value—3; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Jivas Soil

Positions on landscape: Colluvial side slopes of mountains
Parent material: Kind—colluvium over residuum; source—tuff, andesite, rhyolite
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Big sagebrush, Douglas rabbitbrush, lupine, Sandberg bluegrass, bluebunch wheatgrass
Typical profile:
0 to 12 inches—cobbly loam; 25 to 40 percent cobbles and stones and 10 to 20 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC, CL-ML; estimated AASHTO classification - A-2, A-4
12 to 45 inches—extremely gravelly sandy clay loam, extremely gravelly clay loam, extremely gravelly loam; 0 to 10 percent cobbles and stones and 70 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GP-GC; estimated AASHTO classification - A-2
45 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 3.2 to 4.1 inches
Water supplying capacity: 12 to 13 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.15; T value—3; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—near rock outcrops on crests of mountains; contrasting feature—shallow to bedrock; distinctive present vegetation—low sagebrush, bluegrass
Inclusion 2: Position on landscapes—narrow drainageways of mountains; contrasting features—very deep, very poorly drained, receives additional moisture from runoff; distinctive present vegetation—willow, tufted hairgrass
Inclusion 3: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, somewhat poorly drained, very thick and dark-colored upper layer; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 4: Position on landscape—convex shoulders of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 142)

Elements of Wildlife Habitat

Suitability of Ebic soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Ziram soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Jivas soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Ebic Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, rooting depth, large stones
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Ziram Soil

Suitability and limitations for the following uses:

TABLE 142.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Ebic	Ziram	Jivas	1	2	3	4
Bluebunch wheatgrass	AGSP	15-30	15-30	30-50	15-30	---	---	---
Idaho fescue	FEID	30-50	30-50	2-5	30-50	---	---	---
Thurber needlegrass	STTH2	2-10	2-10	2-10	2-10	---	---	---
Bottlebrush squirreltail	SIHY	2-5	2-5	---	2-5	---	---	---
Basin wildrye	ELCI2	---	---	5-10	---	---	50-60	---
Nevada bluegrass	PONE3	---	---	2-5	---	5-10	5-10	---
Tufted hairgrass	DECA5	---	---	---	---	30-60	---	---
Sedge	CAREX	---	---	---	---	5-10	1-5	---
Alpine timothy	PHAL2	---	---	---	---	5-10	---	---
Mat muhly	MURI	---	---	---	---	---	2-5	---
Other perennial grasses	PPGG	2-10	2-10	5-10	2-10	2-10	15-20	---
Balsamroot	BALSA	2-5	2-5	---	2-5	---	---	---
Lupine	LUPIN	---	---	2-5	---	---	2-5	---
Arrowleaf balsamroot	BASA3	---	---	2-5	---	---	---	---
Sierra clover	TRWO	---	---	---	---	2-5	---	---
Cinquefoil	POTEN	---	---	---	---	2-5	---	---
Other perennial forbs	PPFF	5-15	5-15	2-5	5-15	10-20	5-10	---
Low sagebrush	ARAR8	10-25	10-25	---	10-25	---	---	---
Antelope bitterbrush	PUTR2	T-5	T-5	2-5	T-5	---	---	---
Mountain big sagebrush	ARTRV	---	---	5-10	---	---	---	---
Willow	SALIX	---	---	---	---	2-5	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	---	10-15	---
Rubber rabbitbrush	CHNA2	---	---	---	---	---	2-5	---
Other shrubs	SSSS	5-10	5-10	2-10	5-10	---	---	---
Range site symbol		025X017N	025X017N	025X009N	025X017N	025X005N	025X003N	BARRFN
Potential production (lb/acre):								
Favorable years		1,000	1,000	1,300	1,000	2,000	2,500	---
Normal years		700	700	900	700	1,700	1,900	---
Unfavorable years		400	400	700	400	1,000	1,200	---

Rangeland seeding: Poor—rooting depth, large stones
Roadfill: Poor—large stones
Daily cover for landfill: Poor—too clayey, large stones, slope
Shallow excavations: Severe—large stones, slope
Local roads and streets: Severe—large stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones

Jivas Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—large stones, droughty

Roadfill: Poor—slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Moderate—thin layer, large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Ebic soil—VIIs, nonirrigated; Ziram soil—VIIs, nonirrigated; Jivas soil—VIIe, nonirrigated
Range site symbol: Ebic soil—025X017N; Ziram soil—025X017N; Jivas soil—025X009N

982—Ebic-Ziram-Jivas association, steep

Map Unit Setting

Positions on landscape: Mountains
Elevation: 6,500 to 8,100 feet
Climatic data (average annual):
Precipitation—about 13 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Ebic very stony clay loam, 30 to 50 percent slopes (Typic Palexerolls - clayey-skeletal, montmorillonitic, frigid)—35 percent
Ziram very cobbly clay loam, 30 to 50 percent slopes (Typic Palexerolls - clayey-skeletal, montmorillonitic, frigid)—35 percent
Jivas very cobbly loam, 15 to 50 percent slopes (Aridic Argixerolls - loamy-skeletal, mixed, frigid)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Pachic Cryoborolls, 30 to 50 percent slopes (Pachic Cryoborolls - fine-loamy, mixed)—4 percent
Inclusion 2: Cumulic Haplaquolls, 2 to 4 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—4 percent
Inclusion 3: Cumulic Haplaquolls, drained, 2 to 4 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—4 percent
Inclusion 4: Rock outcrop—3 percent

Ebic Soil

Positions on landscape: Crests and upper side slopes of mountains
Parent material: Kind—residuum; source—quartz latite, andesitic tuff
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush, Nevada bluegrass, Thurber needlegrass
Typical profile:
0 to 9 inches—very stony clay loam; 25 to 40 percent cobbles and stones and 30 to 55 percent pebbles (by weight); granular structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC, SC; estimated AASHTO classification - A-6
9 to 23 inches—very cobbly clay, extremely cobbly clay; 30 to 45 percent cobbles and stones and 45 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC, SC; estimated AASHTO classification - A-2
23 inches—unweathered bedrock
Range in depth to bedrock: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow
Available water capacity: 1.7 to 2.3 inches
Water supplying capacity: 10 to 12 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.15; T value—2; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Low

Ziram Soil

Positions on landscape: Middle and lower side slopes of mountains
Parent material: Kind—residuum, colluvium; source—tuff, tuffaceous sandstone
Slope features: Length—short; shape—convex
Dominant present vegetation: Low sagebrush, bluegrass, bottlebrush squirreltail
Typical profile:
0 to 7 inches—very cobbly clay loam; 30 to 65 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC, SC; estimated AASHTO classification - A-2, A-6, A-7
7 to 23 inches—very gravelly clay; 15 to 25 percent cobbles and stones and 35 to 55 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
23 to 42 inches—very cobbly clay, extremely cobbly clay; 50 to 70 percent cobbles and stones and 30 to 55 percent pebbles (by weight); prismatic structure; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GC; estimated AASHTO classification - A-2, A-7
42 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—very slow

Available water capacity: 2.4 to 3.5 inches
Water supplying capacity: 11 to 12 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.15; T value—3; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Jivas Soil

Positions on landscape: Side slopes of mountains
Parent material: Kind—colluvium, residuum; source—tuff, andesite, rhyolite
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Big sagebrush, Douglas rabbitbrush, lupine, Sandberg bluegrass, bluebunch wheatgrass
Typical profile:
0 to 12 inches—very cobbly loam; 40 to 55 percent cobbles and stones and 20 to 50 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, SM-SC, CL-ML; estimated AASHTO classification - A-2, A-4
12 to 45 inches—extremely gravelly sandy clay loam, extremely gravelly clay loam, extremely gravelly loam; 0 to 10 percent cobbles and stones and 70 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC, GP-GC; estimated AASHTO classification - A-2
45 inches—unweathered bedrock
Range in depth to bedrock: 40 to 60 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 3.2 to 4.1 inches
Water supplying capacity: 12 to 13 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (upper layer): K value—0.15; T value—3; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—concave north-facing side slopes of mountains; contrasting features—cooler soil temperatures, receives additional moisture from drifted snow; distinctive present vegetation—antelope bitterbrush, mountain brome, chokecherry
Inclusion 2: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, very poorly drained, receives additional moisture from runoff; distinctive present vegetation—willow, tufted hairgrass
Inclusion 3: Position on landscape—entrenched narrow drainageways of mountains; contrasting features—very deep, somewhat poorly drained, very thick and dark-colored upper layer; distinctive present vegetation—basin big sagebrush, basin wildrye
Inclusion 4: Position on landscape—convex shoulders of mountains; contrasting feature—exposed bedrock at surface; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 143)

Elements of Wildlife Habitat

Suitability of Ebic soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Ziram soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Jivas soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Ebic Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, rooting depth, large stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, too clayey, small stones
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 143.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Ebic	Ziram	Jivas	1	2	3	4
Bluebunch wheatgrass	AGSP	15-30	15-30	30-50	2-5	---	---	---
Idaho fescue	FEID	30-50	30-50	2-5	2-10	---	---	---
Thurber needlegrass	STTH2	2-10	2-10	2-10	---	---	---	---
Bottlebrush squirreltail	SIHY	2-5	2-5	---	---	---	---	---
Basin wildrye	ELCI2	---	---	5-10	---	---	50-60	---
Nevada bluegrass	PONE3	---	---	2-5	2-5	5-10	5-10	---
Mountain brome	BRMA4	---	---	---	5-15	---	---	---
Slender wheatgrass	AGTR	---	---	---	5-15	---	---	---
Bulbous oniongrass	MEBU	---	---	---	2-5	---	---	---
Blue wildrye	ELGL	---	---	---	2-5	---	---	---
Letterman needlegrass	STLE4	---	---	---	2-5	---	---	---
Tufted hairgrass	DECA5	---	---	---	---	30-60	---	---
Sedge	CAREX	---	---	---	---	5-10	1-5	---
Alpine timothy	PHAL2	---	---	---	---	5-10	---	---
Mat muhly	MURI	---	---	---	---	---	2-5	---
Other perennial grasses	PPGG	2-10	2-10	5-10	5-15	2-10	15-20	---
Balsamroot	BALSA	2-5	2-5	---	1-2	---	---	---
Lupine	LUPIN	---	---	2-5	---	---	2-5	---
Arrowleaf balsamroot	BASA3	---	---	2-5	---	---	---	---
Tapertip hawksbeard	CRAC2	---	---	---	1-2	---	---	---
Geranium	GERAN	---	---	---	2-10	---	---	---
Groundsel	SENEC	---	---	---	2-10	---	---	---
Sierra clover	TRWO	---	---	---	---	2-5	---	---
Cinquefoil	POTEN	---	---	---	---	2-5	---	---
Other perennial forbs	PPFF	5-15	5-15	2-5	5-15	10-20	5-10	---
Low sagebrush	ARAR8	10-25	10-25	---	---	---	---	---
Antelope bitterbrush	PUTR2	T-5	T-5	2-5	2-5	---	---	---
Mountain big sagebrush	ARTRV	---	---	5-10	---	---	---	---
Common chokecherry	PRVI	---	---	---	2-5	---	---	---
Snowberry	SYMPH	---	---	---	2-5	---	---	---
Willow	SALIX	---	---	---	---	2-5	---	---
Basin big sagebrush	ARTRT*	---	---	---	---	---	10-15	---
Rubber rabbitbrush	CHNA2	---	---	---	---	---	2-5	---
Other shrubs	SSSS	5-10	5-10	2-10	2-10	---	---	---

Range site symbol	025X017N	025X017N	025X009N	025X004N	025X005N	025X003N	BARREN
Potential production (lb/acre):							
Favorable years	1,000	1,000	1,300	2,600	2,000	2,500	---
Normal years	700	700	900	1,800	1,700	1,900	---
Unfavorable years	400	400	700	1,400	1,000	1,200	---

Ziram Soil

Suitability and limitations for the following uses:
- *Rangeland seeding:* Poor—rooting depth, large stones
- *Roadfill:* Poor—large stones, slope
- *Daily cover for landfill:* Poor—too clayey, large stones, slope
- *Shallow excavations:* Severe—large stones, slope
- *Local roads and streets:* Severe—large stones, slope
- *Pond reservoir areas:* Severe—slope
- *Embankments, dikes, and levees:* Severe—large stones
- *Sand:* Improbable source—excess fines, large stones
- *Gravel:* Improbable source—excess fines, large stones

Jivas Soil

Suitability and limitations for the following uses:
- *Rangeland seeding:* Poor—large stones
- *Roadfill:* Poor—slope
- *Daily cover for landfill:* Poor—small stones, slope
- *Shallow excavations:* Severe—slope
- *Local roads and streets:* Severe—slope
- *Pond reservoir areas:* Severe—slope
- *Embankments, dikes, and levees:* Moderate—thin layer, large stones
- *Sand:* Improbable source—excess fines
- *Gravel:* Improbable source—excess fines

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site symbol: Ebic soil—025X017N; Ziram soil—025X017N; Jivas soil—025X009N

991—Fertaline-Handy association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 6,300 to 7,500 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 44 degrees F
Frost-free season—about 80 days

Composition

Fertaline gravelly loam, 2 to 8 percent slopes (Abruptic Xerollic Durargids - fine, montmorillonitic, frigid)—65 percent
Handy loam, 4 to 15 percent slopes (Xerollic Haplargids - fine, montmorillonitic, frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Aridic Argixerolls, 4 to 15 percent slopes—10 percent
Inclusion 2: Welch loam, drained, 4 to 8 percent slopes (Cumulic Haplaquolls - fine-loamy, mixed, frigid)—5 percent

Fertaline Soil

Positions on landscape: Summits and upper side slopes of fan piedmont remnants
Parent material: Mixed alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Low sagebrush, Sandberg bluegrass, small rabbitbrush, Indian ricegrass
Typical profile:
0 to 8 inches—gravelly loam; 0 to 10 percent cobbles and stones and 20 to 45 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM-SC, GM-GC, CL-ML; estimated AASHTO classification - A-4
8 to 22 inches—clay; 0 to 10 percent cobbles and stones and 0 to 25 percent pebbles (by weight); prismatic structure; very hard, very firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL, CH; estimated AASHTO classification - A-7
22 to 28 inches or more—indurated hardpan
Range in depth to hardpan: 20 to 30 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—very slow
Available water capacity: 2.8 to 3.2 inches
Water supplying capacity: 9 to 11 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—2; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Handy Soil

Positions on landscape: Side slopes of fan piedmont remnants
Parent material: Kind—alluvium; source—volcanic rock
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Big sagebrush, rabbitbrush, Indian ricegrass
Typical profile:
0 to 9 inches—loam; 0 to 5 percent cobbles and stones and 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML, CL, ML; estimated AASHTO classification - A-4, A-6
9 to 21 inches—gravelly clay, clay; 0 to 5 percent cobbles and stones and 0 to 40 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CH, CL; estimated AASHTO classification - A-7
21 to 60 inches or more—stratified gravelly loam to very gravelly loamy sand; 0 to 5 percent cobbles and stones and 40 to 70 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM; estimated AASHTO classification - A-1, A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Slow
Available water capacity: 6.0 to 7.4 inches
Water supplying capacity: 10 to 12 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.32; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—north-facing side slopes of fan piedmont remnants; contrasting feature—dark-colored upper layer; distinctive present vegetation—big sagebrush, rabbitbrush, Indian ricegrass
Inclusion 2: Position on landscape—entrenched inset fans on fan piedmont remnants; contrasting features—thick and dark-colored upper layer, moderately wet; distinctive present vegetation—basin big sagebrush, basin wildrye

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 144)

Elements of Wildlife Habitat

Suitability of Fertaline soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Handy soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Fertaline Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—rooting depth
Roadfill: Poor—cemented pan, low strength, shrink-swell
Daily cover for landfill: Poor—cemented pan, hard to pack
Shallow excavations: Severe—cemented pan
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Moderate—cemented pan, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Handy Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—rooting depth
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site symbol: Fertaline soil—028B045N; Handy soil—025X014N

TABLE 144.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Fertaline	Handy	1	2
Bluebunch wheatgrass	AGSP	2-5	20-30	---	5-10
Indian ricegrass	ORHY	5-10	---	---	5-10
Thurber needlegrass	STTH2	5-10	15-25	---	20-30
Sandberg bluegrass	POSE	5-10	---	---	2-5
Bottlebrush squirreltail	SIHY	2-5	---	---	---
Nevada bluegrass	PONE3	---	2-10	5-10	---
Basin wildrye	ELCI2	---	---	30-50	---
Western wheatgrass	AGSM	---	---	5-10	1-2
Needleandthread	STCO4	---	---	---	2-5
Pine bluegrass	POSC	---	---	---	2-5
Other perennial grasses	PPGG	5-10	10-15	5-15	5-8
Tapertip hawksbeard	CRAC2	---	---	---	2-5
Arrowleaf balsamroot	BASA3	---	---	---	2-5
Lupine	LUPIN	---	---	---	2-5
White stoneseed	LIRU4	---	---	---	1-5
Other perennial forbs	PPFF	5-10	2-5	5-10	---
Annual forbs	AAFF	1-2	---	---	2-5
Low sagebrush	ARAR8	25-30	---	---	---
Big sagebrush	ARTR2	---	10-15	---	10-15
Douglas rabbitbrush	CHVI8	---	5-10	---	---
Basin big sagebrush	ARTRT*	---	---	5-10	---
Mountain big sagebrush	ARTRV	---	---	1-2	---
Rubber rabbitbrush	CHNA2	---	---	2-5	---
Rabbitbrush	CHRYS9	---	---	---	2-5
Antelope bitterbrush	PUTR2	---	---	---	1-10
Other shrubs	SSSS	10-15	---	5-10	5-10
Range site symbol		028B045N	025X014N	028B024N	028B007N
Potential production (lb/acre):					
Favorable years		800	1,000	2,800	1,000
Normal years		600	800	1,700	800
Unfavorable years		400	600	1,000	600

1001—Solak-Highams-Hymas association

Map Unit Setting

Positions on landscape: Crests and side slopes of mountains
Elevation: 5,200 to 7,800 feet
Climatic data (average annual):
Precipitation—about 12 inches
Air temperature—about 43 degrees F
Frost-free season—about 80 days

Composition

Solak very gravelly loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents - loamy-skeletal, mixed (calcareous), frigid)—40 percent
Highams gravelly loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents - loamy-skeletal, carbonatic, frigid)—25 percent
Hymas cobbly loam, 30 to 75 percent slopes (Lithic Haploxerolls - loamy-skeletal, carbonatic, frigid)—25 percent
Contrasting inclusions as follows:
Inclusion 1: Cumulic Haplaquolls, 4 to 8 percent slopes (Cumulic Haplaquolls - loamy-skeletal, mixed, frigid)—4 percent
Inclusion 2: Rock outcrop—3 percent
Inclusion 3: Rubble land—3 percent

Solak Soil

Positions on landscape: Crests and side slopes of mountains
Parent material: Kind—residuum; source—tuff, chert, siliceous shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, littleleaf horsebrush, bluebunch wheatgrass, Nevada bluegrass
Typical profile:
0 to 10 inches—very gravelly loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC; estimated AASHTO classification - A-2, A-4
10 inches—unweathered bedrock
Range in depth to bedrock: 10 to 14 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 0.7 to 0.9 inch
Water supplying capacity: 9 to 10 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.05; T value—1; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Highams Soil

Positions on landscape: Middle and upper side slopes of mountains
Parent material: Kind—residuum; source—limestone, dolostone
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, bluebunch wheatgrass, bluegrass
Typical profile:
0 to 5 inches—gravelly loam; 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, CL-ML, CL; estimated AASHTO classification - A-4, A-6
5 to 13 inches—very gravelly loam, very cobbly loam; 0 to 40 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM-GC, GC; estimated AASHTO classification - A-2, A-4, A-6
13 inches—unweathered bedrock
Range in depth to bedrock: 10 to 17 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 1.1 to 1.5 inches
Water supplying capacity: 10 to 11 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.20; T value—1; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Hymas Soil

Positions on landscape: Lower side slopes of mountains
Parent material: Kind—residuum; source—limestone, calcareous shale
Slope features: Length—long; shape—slightly concave

Dominant present vegetation: Singleleaf pinyon, Utah juniper, big sagebrush, bluebunch wheatgrass, bluegrass
Typical profile:
0 to 3 inches—cobbly loam; 15 to 35 percent cobbles and stones and 10 to 30 percent pebbles (by weight); granular structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML, GM, SM; estimated AASHTO classification - A-4
3 to 12 inches—very cobbly loam, extremely gravelly loam, extremely cobbly loam, very gravelly loam; 30 to 70 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GM, GM-GC; estimated AASHTO classification - A-1, A-2
12 inches—unweathered bedrock
Range in depth to bedrock: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 0.8 to 1.4 inches
Water supplying capacity: 10 to 12 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.32; T value—1; wind erodibility group—8
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—narrow drainageways of mountains; contrasting features—very deep, wet, thick and dark-colored upper layer; distinctive present vegetation—willow, tufted hairgrass
Inclusion 2: Position on landscape—convex crests and upper side slopes of mountains; contrasting feature—exposed bedrock at the surface; distinctive present vegetation—barren
Inclusion 3: Position on landscape—upper side slopes of mountains; contrasting feature—more than 90 percent of surface covered with stones; distinctive present vegetation—barren

Major Uses

Rangeland, wildlife habitat, woodland

Potential Native Plant Community (Table 145)

Woodland

Highams Soil

Site index for common trees: Singleleaf pinyon—30; Utah juniper—30
Most important native understory plants: Indian ricegrass, bluebunch wheatgrass, Thurber needlegrass, black sagebrush

Hymas Soil

Site index for common trees: Singleleaf pinyon—40; Utah juniper—40
Most important native understory plants: Indian ricegrass, needleandthread, bluebunch wheatgrass, Thurber needlegrass, big sagebrush

Elements of Wildlife Habitat

Suitability of Solak soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Highams soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—poor
Suitability of Hymas soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor

Ratings for Selected Uses

Solak Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, depth to rock, small stones
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Highams Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, small stones, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—depth to rock, slope

TABLE 145.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Solak	Highams	Hymas	1	2	3
Indian ricegrass	ORHY	5-15	X	X	---	---	---
Needleandthread	STCO4	5-15	---	X	---	---	---
Pine bluegrass	POSC	2-5	X	X	---	---	---
Bluebunch wheatgrass	AGSP	1-3	X	X	---	---	---
Thurber needlegrass	STTH2	---	X	X	---	---	---
Bottlebrush squirreltail	SIHY	---	X	X	---	---	---
Sandberg bluegrass	POSE	---	X	X	---	---	---
Nevada bluegrass	PONE3	---	---	X	5-10	---	---
Tufted hairgrass	DECA5	---	---	---	30-60	---	---
Sedge	CAREX	---	---	---	5-10	---	---
Alpine timothy	PHAL2	---	---	---	5-10	---	---
Other perennial grasses	PPGG	5-10	X	X	2-10	---	---
Sierra clover	TRWO	---	---	---	2-5	---	---
Cinquefoil	POTEN	---	---	---	2-5	---	---
Other perennial forbs	PPFF	5-15	X	X	10-20	---	---
Black sagebrush	ARARN	20-25	X	---	---	---	---
Fourwing saltbush	ATCA2	2-5	---	---	---	---	---
Bud sagebrush	ARSP5	2-5	---	---	---	---	---
Utah juniper	JUOS	---	X	X	---	---	---
Singleleaf pinyon	PIMO	---	X	X	---	---	---
Big sagebrush	ARTR2	---	---	X	---	---	---
Willow	SALIX	---	---	---	2-5	---	---
Other shrubs	SSSS	10-20	X	X	---	---	---
Range site symbol		028B016N	---	---	025X005N	BARREN	BARREN
Woodland site symbol		---	025X063N	025X062N	---	---	---
Potential production (lb/acre):							
Favorable years		500	400	500	2,000	---	---
Normal years		250	300	300	1,700	---	---
Unfavorable years		150	200	250	1,000	---	---

Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Hymas Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, erodes easily
Roadfill: Poor—depth to rock, large stones, slope
Daily cover for landfill: Poor—depth to rock, large stones, slope
Shallow excavations: Severe—depth to rock, large stones, slope
Local roads and streets: Severe—depth to rock, slope, large stones
Pond reservoir areas: Severe—depth to rock, slope

Embankments, dikes, and levees: Severe—large stones, thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Solak soil—VIIs, nonirrigated; Highams soil—VIIe, nonirrigated; Hymas soil—VIIe, nonirrigated
Range site symbol: Solak soil—028B016N
Woodland suitability group: Highams soil—3d; Hymas soil—3d

1010—Bubus loam, 0 to 2 percent slopes

Map Unit Setting

Positions on landscape: Remnants of alluvial flats
Elevation: 6,200 to 6,800 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 49 degrees F
Frost-free season—about 110 days

Composition

Bubus loam, 0 to 2 percent slopes (Durorthidic Torriorthents - coarse-loamy, mixed (calcareous), mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Aquic Torriorthents, 0 to 2 percent slopes—5 percent
Inclusion 2: Jesse Camp silt loam, 0 to 2 percent slopes (Xerollic Camborthids - fine-silty, mixed, frigid)—5 percent
Inclusion 3: Silverado sandy loam, 0 to 8 percent slopes (Durixerollic Camborthids - coarse-loamy, mixed, frigid)—5 percent

Bubus Soil

Positions on landscape: Remnants of alluvial flats
Parent material: Mixed alluvium influenced by loess and volcanic ash high in pyroclastic material
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, shadscale, inland saltgrass, basin wildrye
Typical profile:
0 to 4 inches—loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML; estimated AASHTO classification - A-4
4 to 60 inches or more—stratified fine sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification - ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 9.0 to 10.2 inches
Water supplying capacity: 5 to 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.49; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans dissecting alluvial flat remnants; contrasting feature—seasonal high water table at a depth of 20 to 40 inches; distinctive present vegetation—alkali sacaton, basin wildrye, alkali muhly, rabbitbrush
Inclusion 2: Position on landscape—swales on upper part of inset fans dissecting alluvial flat remnants; contrasting features—nonsaline, nonsodic, silty throughout the profile; distinctive present vegetation—basin big sagebrush, basin wildrye, rabbitbrush
Inclusion 3: Position on landscape—fan skirts adjacent to upper margins of alluvial flat remnants; contrasting features—nonsaline, nonsodic, noncalcareous upper layer over a layer of weak silica cementation; distinctive present vegetation—big sagebrush, rabbitbrush

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 146)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Slight
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 146.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Bubus	1	2	3
Bottlebrush squirreltail	SIHY	7-10	---	---	5-10
Inland saltgrass	DIST	T-2	5-10	---	---
Basin wildrye	ELCI2	T-2	5-15	30-50	---
Alkali sacaton	SPAI	---	20-30	---	---
Wheatgrass	AGROP2	---	---	2-5	---
Nevada bluegrass	PONE3	---	---	2-5	---
Indian ricegrass	ORHY	---	---	---	20-30
Needleandthread	STCO4	---	---	---	10-20
Sandberg bluegrass	POSE	---	---	---	2-5
Other perennial grasses	PPGG	---	10-20	15-25	5-10
Miterwort	NITRO	2-3	---	---	---
Other perennial forbs	PPFF	T-3	5-10	2-5	2-5
Shadscale	ATCO	30-40	---	---	---
Bud sagebrush	ARSP5	5-10	---	---	---
Black greasewood	SAVE4	20-30	5-10	---	---
Seepweed	SUAED	5-15	---	---	---
Basin big sagebrush	ARTRT*	---	2-5	5-10	---
Fourwing saltbush	ATCA2	---	2-5	---	---
Rubber rabbitbrush	CHNA2	---	2-5	---	---
Wyoming big sagebrush	ARTRW*	---	---	1-2	15-20
Other shrubs	SSSS	---	2-5	5-8	5-10
Range site symbol		024X003N	028B004N	028B003N	028B010N
Potential production (lb/acre):					
Favorable years		600	2,000	2,600	800
Normal years		450	1,000	1,250	600
Unfavorable years		300	500	800	400

Interpretive Groups

Range site symbol: 024X003N

Capability classification: IIs, irrigated, and VIIs, nonirrigated

1011—Bubus very fine sandy loam, slightly saline-alkali, 2 to 8 percent slopes

Map Unit Setting

Positions on landscape: Basin floor remnants, stream terraces
Elevation: 5,500 to 5,800 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 49 degrees F
Frost-free season—about 110 days

Composition

Bubus very fine sandy loam, slightly saline-alkali, 2 to 8 percent slopes (Durorthidic Torriorthents - coarse-loamy, mixed (calcareous), mesic)—90 percent
Contrasting inclusions as follows:
Inclusion 1: Typic Camborthids, 0 to 8 percent slopes—5 percent
Inclusion 2: Xerollic Camborthids, 0 to 8 percent slopes—5 percent

Bubus Soil

Positions on landscape: Remnants of alluvial flats and stream terraces
Parent material: Mixed alluvium that is high in content of pyroclastic material influenced by loess and volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Typical profile:
0 to 9 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4
9 to 29 inches—stratified fine sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML; estimated AASHTO classification - A-4
29 to 49 inches—stratified fine sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; very strongly alkaline (pH 9.4); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification - ML; estimated AASHTO classification - A-4
49 to 60 inches or more—stratified sand to gravelly loamy sand; 15 to 40 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 9.0); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 15 to 30); estimated Unified classification - SM; estimated AASHTO classification - A-1, A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 49 inches—moderate; below this depth—very rapid
Available water capacity: 7.8 to 9.0 inches
Water supplying capacity: 5 to 8 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.49; T value—4; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—smooth fan skirts along the upper margin of the alluvial flat remnants; contrasting features—noncalcareous upper layer, does not have a layer of weak silica cementation, moderately well drained; distinctive present vegetation—black greasewood, shadscale
Inclusion 2: Position on landscape—inset fans dissecting the alluvial flat remnants; contrasting features—receives additional moisture from runoff, does not have a layer of weak silica cementation; distinctive present vegetation—big sagebrush, Thurber needlegrass

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 147)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Good

TABLE 147.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Bubus	1	2
Indian ricegrass	ORHY	5-15	---	2-5
Bottlebrush squirreltail	SIHY	5-10	7-10	2-5
Bluegrass	POA++	2-5	---	---
Inland saltgrass	DIST	---	T-2	---
Basin wildrye	ELCI2	---	T-2	---
Thurber needlegrass	STTH2	---	---	20-30
Bluebunch wheatgrass	AGSP	---	---	5-10
Pine bluegrass	POSC	---	---	2-5
Other perennial grasses	PPGG	---	---	2-10
Globemallow	SPHAE	2-3	---	2-3
Miterwort	NITRO	---	2-3	---
Other perennial forbs	PPFF	2-4	T-3	5-10
Shadscale	ATCO	30-35	30-40	---
Bud sagebrush	ARSP5	25-30	5-10	---
Black greasewood	SAVE4	---	20-30	---
Seepweed	SUAED	---	5-15	---
Wyoming big sagebrush	ARTRW*	---	---	15-20
Downy rabbitbrush	CHVIP	---	---	2-5
Other shrubs	SSSS	2-5	---	2-8
Range site symbol		024X002N	024X003N	024X005N
Potential production (lb/acre):				
Favorable years		700	600	800
Normal years		450	450	600
Unfavorable years		300	300	400

Daily cover for landfill: Poor—thin layer
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—piping, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIIe, irrigated, and VIIc, nonirrigated
Range site symbol: 024X002N

1012—Bubus-Dianev association

Map Unit Setting

Positions on landscape: Stream terraces, basin floor remnants, flood plains
Elevation: 6,200 to 6,800 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 49 degrees F
Frost-free season—about 100 days

Composition

Bubus loam, 0 to 2 percent slopes (Durorthidic Torriorthents - coarse-loamy, mixed (calcareous), mesic)—50 percent
Bubus loam, gullied, frequently flooded, 0 to 2 percent slopes (Durorthidic Torriorthents - coarse-loamy, mixed (calcareous), mesic)—20 percent
Dianev silt loam, occasionally flooded, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), frigid)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Aquic Torriorthents, 0 to 2 percent slopes—5 percent
Inclusion 2: Typic Camborthids, 0 to 2 percent slopes—3 percent
Inclusion 3: Brinnum silt loam, 0 to 2 percent slopes (Typic Halaquepts - fine-silty, mixed (calcareous), mesic)—2 percent

Bubus, Nonflooded, Soil

Positions on landscape: Stream terraces
Parent material: Mixed alluvium influenced by loess and volcanic ash and high in content of pyroclastic material
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, shadscale, basin wildrye, big sagebrush
Typical profile:
0 to 4 inches—loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML; estimated AASHTO classification - A-4
4 to 60 inches or more—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated AASHTO classification - ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 9.0 to 10.2 inches
Water supplying capacity: 5 to 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.49; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: Low

Bubus, Frequently Flooded, Soil

Positions on landscape: Alluvial flat remnants adjacent to stream channels
Parent material: Mixed alluvium influenced by loess and volcanic ash and high in content of pyroclastic material
Slope features: Length—short; shape—smooth
Dominant present vegetation: Big sagebrush, rabbitbrush, basin wildrye
Typical profile:
0 to 9 inches—loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification - ML; estimated AASHTO classification - A-4
9 to 60 inches or more—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 9.0); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic to moderately sodic (SAR 15 to 46); estimated Unified classification - ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Frequency—frequent; duration—brief; months—February through May
Permeability: Moderate
Available water capacity: 9.0 to 10.2 inches
Water supplying capacity: 5 to 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.49; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Low

Dianev Soil

Positions on landscape: Flood plains
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth

Dominant present vegetation: Basin wildrye, alkali muhly, inland saltgrass
Typical profile:
0 to 5 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); slightly saline (4 to 8 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 40); estimated Unified classification - CL-ML, ML; estimated AASHTO classification - A-4
5 to 57 inches—silty clay loam, silt loam; massive; slightly hard, friable; strongly alkaline (pH 9.0); slightly saline (4 to 8 mmhos/cm); slightly sodic to moderately sodic (SAR 15 to 40); estimated Unified classification - CL; estimated AASHTO classification - A-6, A-7
57 to 60 inches or more—stratified loamy sand to clay; single grain; loose; strongly alkaline (pH 9.0); slightly saline (4 to 8 mmhos/cm); nonsodic to slightly sodic (SAR 5 to 20); estimated Unified classification - CL; estimated AASHTO classification - A-6
Depth to seasonal high water table: In March through June—30 to 48 inches; rest of year—more than 48 inches
Hazard of flooding: Frequency—occasional; duration—brief; months—December through March
Permeability: Slow
Available water capacity: 8.5 to 9.8 inches
Water supplying capacity: 9 to 10 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.64; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—low stream terraces adjacent to flood plains; contrasting features—does not have a layer of weak silica cementation, seasonal high water table at a depth of 48 to 60 inches; distinctive present vegetation—black greasewood, shadscale
Inclusion 2: Position on landscape—fan skirts adjacent to margins of alluvial flat remnants and stream terraces; contrasting features—well drained, does not have a layer of weak silica cementation, nonsaline, nonsodic; distinctive present vegetation—shadscale

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 148)

Elements of Wildlife Habitat

Suitability of Bubus, nonflooded, soil for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—very poor
Suitability of Bubus, frequently flooded, soil for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor
Suitability of Dianev soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—fair
Shallow water areas—fair

Ratings for Selected Uses

Bubus, Nonflooded, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Slight
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Bubus, Frequently Flooded, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 148.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Bubus	Bubus, gullied	Dianev	1	2	3
Bottlebrush squirreltail	SIHY	7-10	2-5	---	---	2-5	2-5
Inland saltgrass	DIST	T-2	---	5-10	---	---	---
Basin wildrye	ELCI2	T-2	10-20	5-15	---	5-10	---
Needleandthread	STCO4	---	2-5	---	---	---	5-10
Indian ricegrass	ORHY	---	2-5	---	---	2-5	5-10
Alkali sacaton	SPAI	---	---	20-30	30-40	---	---
Alkali cordgrass	SPGR	---	---	---	5-10	---	---
Alkali muhly	MUAS	---	---	---	5-15	---	---
Other perennial grasses	PPGG	---	5-10	10-20	10-15	2-5	5-10
Miterwort	NITRO	2-3	---	---	---	---	---
Thelypody	THELY	---	---	---	---	2-4	---
Globemallow	SPHAE	---	---	---	---	1-2	---
Other perennial forbs	PPFF	T-3	5-10	5-10	5-10	1-2	5-10
Shadscale	ATCO	30-40	---	---	---	---	30-40
Bud sagebrush	ARSP5	5-10	---	---	---	---	5-10
Black greasewood	SAVE4	20-30	---	5-10	---	20-30	---
Seepweed	SUAED	5-15	---	---	---	---	---
Basin big sagebrush	ARTRT*	---	10-15	2-5	---	10-25	---
Fourwing saltbush	ATCA2	---	2-5	2-5	---	---	3-5
Rabbitbrush	CHRYS9	---	2-5	---	---	---	---
Nevada ephedra	EPNE	---	2-5	---	---	---	---
Rubber rabbitbrush	CHNA2	---	---	2-5	---	---	---
Spiny hopsage	GRSP	---	---	---	---	5-15	---
Winterfat	EULA5	---	---	---	---	---	2-5
Other shrubs	SSSS	---	5-10	2-5	5-10	2-10	5-15

Range site symbol	024X003N	028B009N	028B004N	028B002N	024X022N	028B017N
Potential production (lb/acre):						
Favorable years	600	700	2,000	3,000	800	700
Normal years	450	400	1,000	1,500	600	500
Unfavorable years	300	300	500	700	350	250

Dianev Soil

Rangeland seeding: Poor—excess salt, excess sodium
Roadfill: Fair—shrink-swell
Daily cover for landfill: Poor—excess sodium
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—low strength, flooding, frost action
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess sodium
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Bubus, nonflooded, soil—IIs, irrigated, and VIIs, nonirrigated; Bubus, frequently

flooded, soil—IIw, irrigated, and VIIw, nonirrigated; Dianev soil—IIIw, irrigated, and VIIw, nonirrigated

Range site symbol: Bubus, nonflooded, soil—024X003N; Bubus, frequently flooded, soil—028B009N; Dianev soil—028B004N

1022—Nevador-Ricert-Tulase association

Map Unit Setting

Positions on landscape: Fan-piedmont remnants
Elevation: 5,000 to 6,000 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 47 degrees F
Frost-free season—about 100 days

Composition

Nevador very fine sandy loam, 2 to 8 percent slopes (Durixerollic Haplargids - fine-loamy, mixed, mesic)—40 percent
Ricert sandy loam, 0 to 4 percent slopes (Duric Natrargids - fine-loamy, mixed, mesic)—30 percent
Tulase silt loam, 2 to 8 percent slopes (Durorthidic Xeric Torriorthents - coarse-silty, mixed (calcareous), mesic)—20 percent
Contrasting inclusions as follows:
Inclusion 1: Typic Camborthids, 4 to 15 percent slopes—5 percent
Inclusion 2: Durixerollic Camborthids, 4 to l5 percent slopes—5 percent

Nevador Soil

Positions on landscape: Summits of slightly dissected upper part of fan piedmont remnants
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth to convex
Dominant present vegetation: Wyoming big sagebrush, basin wildrye, Sandberg bluegrass
Typical profile:
0 to 5 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4
5 to 22 inches—clay loam, sandy clay loam, loam; 0 to 10 percent cobbles and stones and 10 to 20 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, CL; estimated AASHTO classification - A-6, A-7
22 to 60 inches or more—stratified fine sandy loam to loamy sand; 0 to 10 percent cobbles and stones and 10 to 30 percent pebbles (by weight); massive; hard, friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification - SM; estimated AASHTO classification - A-2, A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Between depths of 5 and 22 inches—moderately slow; below this depth—moderately rapid
Available water capacity: 7.3 to 8.5 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow to medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.43; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Moderate

Ricert Soil

Positions on landscape: Summits of slightly dissected lower part of fan piedmont remnants
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—smooth to concave
Dominant present vegetation: Shadscale, bud sagebrush, Indian ricegrass, bottlebrush squirreltail
Typical profile:
0 to 5 inches—sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM-SC, CL-ML; estimated AASHTO classification - A-4, A-2
5 to 14 inches—clay loam, loam; 0 to 15 percent pebbles (by weight); prismatic structure; hard, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CL; estimated AASHTO classification - A-6, A-7
14 to 20 inches—loam, silt loam, clay loam; 0 to 5 percent cobbles and stones and 5 to 20 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CL; estimated AASHTO classification - A-6
20 to 60 inches or more—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly loamy sand; 0 to 15 percent cobbles and stones and 50 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25);

estimated Unified classification - GM, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 20 inches—moderately slow; below this depth—moderately rapid
Available water capacity: 4.3 to 6.3 inches
Water supplying capacity: 5 to 7 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.20; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential frost action: Low

Tulase Soil

Positions on landscape: Inset fans
Parent material: Silty alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, bluebunch wheatgrass
Typical profile:
0 to 5 inches—silt loam; platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 70 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 9.2 to 12.6 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow to medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—lower side slopes of fan piedmonts; contrasting features—does not have a layer of silica cementation, does not have a layer of clay accumulation; distinctive present vegetation—black greasewood, shadscale
Inclusion 2: Position on landscape—convex dissected shoulders and upper side slopes of fan piedmonts; contrasting features—leached in the upper 20 inches, does not have a layer of clay accumulation; distinctive present vegetation—big sagebrush, bluegrass

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 149)

Elements of Wildlife Habitat

Suitability of Nevador soil for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor
Suitability of Ricert soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—very poor
Shallow water areas—very poor
Suitability of Tulase soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Nevador Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, excess salt
Roadfill: Good
Daily cover for landfill: Fair—too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Moderate—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Ricert Soil

Suitability and limitations for the following uses:

TABLE 149.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Nevador	Ricert	Tulase	1	2
Thurber needlegrass	STTH2	20-30	---	10-40	---	20-30
Bluebunch wheatgrass	AGSP	5-10	---	10-40	---	5-10
Indian ricegrass	ORHY	2-5	5-15	2-10	2-5	2-5
Pine bluegrass	POSC	2-5	---	---	---	2-5
Bottlebrush squirreltail	SIHY	2-5	5-10	---	2-5	2-5
Bluegrass	POA++	---	2-5	2-10	---	---
Basin wildrye	ELCI2	---	---	5-15	5-10	---
Webber ricegrass	ORWE	---	---	2-10	---	---
Other perennial grasses	PPGG	2-10	---	5-10	2-5	2-10
Globemallow	SPHAE	2-3	2-3	---	1-2	2-3
Thelypody	THELY	---	---	---	2-4	---
Other perennial forbs	PPFF	5-10	2-4	5-10	1-2	5-10
Wyoming big sagebrush	ARTRW*	15-20	---	---	---	15-20
Downy rabbitbrush	CHVIP	2-5	---	---	---	2-5
Shadscale	ATCO	---	30-35	---	---	---
Bud sagebrush	ARSP5	---	25-30	---	---	---
Big sagebrush	ARTR2	---	---	10-15	---	---
Black greasewood	SAVE4	---	---	---	20-30	---
Basin big sagebrush	ARTRT*	---	---	---	10-25	---
Spiny hopsage	GRSP	---	---	---	5-15	---
Other shrubs	SSSS	2-8	2-5	5-15	2-10	2-8
Range site symbol		024X005N	024X002N	025X019N	024X022N	024X005N
Potential production (lb/acre):						
Favorable years		800	700	800	800	800
Normal years		600	450	600	600	600
Unfavorable years		400	300	400	350	400

Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Good
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess sodium
Sand: Probable source
Gravel: Probable source

Tulase Soil

Suitability and limitations for the following uses:
Rangeland seeding: Moderate—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Nevador soil—IIIe, irrigated, and VIc, nonirrigated; Ricert soil—IVe, irrigated, and VIIs, nonirrigated; Tulase soil—IIIe, irrigated, and VIc, nonirrigated

Range site symbol: Nevador soil—024X005N; Ricert soil—024X002N; Tulase soil—025X019N

1060—Allker gravelly sandy loam, 2 to 8 percent slopes

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 5,500 to 6,300 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 48 degrees F
Frost-free season—about 100 days

Composition

Allker gravelly sandy loam, 2 to 8 percent slopes (Durixerollic Haplargids - fine-loamy over sandy or sandy-skeletal, mixed, mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Durixerollic Camborthids, 0 to 4 percent slopes—5 percent
Inclusion 2: Ricert sandy loam, 0 to 4 percent slopes (Duric Natrargids - fine-loamy, mixed, mesic)—5 percent
Inclusion 3: Aquic Torriorthents, 0 to 2 percent slopes—5 percent

Allker Soil

Positions on landscape: Summits of fan piedmonts
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—smooth to slightly concave
Dominant present vegetation: Wyoming big sagebrush, bottlebrush squirreltail, Indian ricegrass
Typical profile:
0 to 7 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones and 25 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM; estimated AASHTO classification - A-1, A-2
7 to 26 inches—gravelly clay loam, gravelly loam, gravelly sandy clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SC, GC; estimated AASHTO classification - A-6
26 to 37 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - GM, GM-GC, SM, SM-SC; estimated AASHTO classification - A-4
37 to 60 inches or more—very gravelly sandy loam, very gravelly loamy sand; 0 to 10 percent cobbles and stones and 50 to 75 percent pebbles (by weight); single grain; loose; very strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - GM, GP-GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 37 inches—moderately slow; below this depth—rapid
Available water capacity: 5.6 to 7.3 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.17; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans; contrasting feature—does not have a layer of clay accumulation; distinctive present vegetation—big sagebrush, Indian ricegrass, rabbitbrush
Inclusion 2: Position on landscape—slightly convex summits of erosional fan piedmont remnants; contrasting feature—sodium-affected middle layer; distinctive present vegetation—shadscale, bud sagebrush, Indian ricegrass
Inclusion 3: Position on landscape—smooth to concave alluvial fans and fan skirts adjacent to lower margins of fan piedmonts; contrasting features—moderately wet, saline, sodic; distinctive present vegetation—basin wildrye, alkali sacaton, inland saltgrass, rabbitbrush

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 150)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—very poor
Shallow water areas—very poor

TABLE 150.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Allker	1	2	3
Thurber needlegrass	STTH2	20-30	20-30	---	---
Bluebunch wheatgrass	AGSP	5-10	5-10	---	---
Indian ricegrass	ORHY	2-5	2-5	5-15	---
Pine bluegrass	POSC	2-5	2-5	---	---
Bottlebrush squirreltail	SIHY	2-5	2-5	5-10	---
Bluegrass	POA++	---	---	2-5	---
Basin wildrye	ELCI2	---	---	---	40-60
Alkali sacaton	SPAI	---	---	---	15-30
Inland saltgrass	DIST	---	---	---	5-10
Other perennial grasses	PPGG	2-10	2-10	---	2-4
Globemallow	SPHAE	2-3	2-3	2-3	---
Povertyweed	IVAX	---	---	---	1-2
Other perennial forbs	PPFF	5-10	5-10	2-4	2-4
Wyoming big sagebrush	ARTRW*	15-20	15-20	---	---
Downy rabbitbrush	CHVIP	2-5	2-5	---	---
Shadscale	ATCO	---	---	30-35	---
Bud sagebrush	ARSP5	---	---	25-30	---
Black greasewood	SAVE4	---	---	---	5-15
Rubber rabbitbrush	CHNA2	---	---	---	2-5
Other shrubs	SSSS	2-8	2-8	2-5	2-5
Range site symbol		024X005N	024X005N	024X002N	024X007N
Potential production (lb/acre):					
Favorable years		800	800	700	1,900
Normal years		600	600	450	1,400
Unfavorable years		400	400	300	800

Ratings for Selected Uses

Suitability and limitations for the following uses:

Rangeland seeding: Fair—too arid

Roadfill: Good

Daily cover for landfill: Poor—seepage, too sandy, small stones

Shallow excavations: Severe—cutbanks cave

Local roads and streets: Moderate—frost action, shrink-swell

Pond reservoir areas: Severe—seepage

Embankments, dikes, and levees: Severe—seepage

Sand: Probable source

Gravel: Probable source

Interpretive Groups

Capability classification: IIIe, irrigated, and VIc, nonirrigated

Range site symbol: 024X005N

1201—Tulase silt loam, 2 to 8 percent slopes

Map Unit Setting

Positions on landscape: Inset fans
Elevation: 5,100 to 5,800 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 48 degrees F
Frost-free season—about 100 days

Composition

Tulase silt loam, 2 to 8 percent slopes (Durorthidic Xeric Torriorthents - coarse-silty, mixed (calcareous), mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Xeric Torriorthents, 2 to 8 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), mesic)—10 percent
Inclusion 2: Durorthidic Xeric Torriorthents, 2 to 8 percent slopes (Durorthidic Xeric Torriorthents - fine-silty, mixed (calcareous), mesic)—5 percent

Tulase Soil

Positions on landscape: Inset fans
Parent material: Silty alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, crested wheatgrass, bluebunch wheatgrass
Typical profile:
0 to 5 inches—silt loam; platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 70 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 9.2 to 12.6 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow to medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—margins of inset fans; contrasting features—loamy throughout the profile, does not have a layer of silica cementation; distinctive present vegetation—Wyoming big sagebrush, bluebunch wheatgrass
Inclusion 2: Position on landscape—swales on inset fans; contrasting feature—silty clay loam throughout the profile; distinctive present vegetation—Wyoming big sagebrush, bluebunch wheatgrass

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 151)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIIe, irrigated, and VIc, nonirrigated
Range site symbol: 025X019N

TABLE 151.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Tulase	1	2
Bluebunch wheatgrass	AGSP	10-40	10-40	10-40
Thurber needlegrass	STTH2	10-40	10-40	10-40
Basin wildrye	ELCI2	5-15	5-15	5-15
Indian ricegrass	ORHY	2-10	2-10	2-10
Webber ricegrass	ORWE	2-10	2-10	2-10
Bluegrass	POA++	2-10	2-10	2-10
Other perennial grasses	PPGG	5-10	5-10	5-10
Perennial forbs	PPFF	5-10	5-10	5-10
Big sagebrush	ARTR2	10-15	10-15	10-15
Other shrubs	SSSS	5-15	5-15	5-15
Range site symbol		025X019N	025X019N	025X019N
Potential production (lb/acre):				
Favorable years		800	800	800
Normal years		600	600	600
Unfavorable years		400	400	400

1202—Tulase silt loam, 0 to 2 percent slopes

Map Unit Setting

Positions on landscape: Inset fans, fan skirts
Elevation: 5,100 to 5,800 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 48 degrees F
Frost-free season—about 100 days

Composition

Tulase silt loam, 0 to 2 percent slopes (Durorthidic Xeric Torriorthents - coarse-silty, mixed (calcareous), mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Durorthidic Xeric Torriorthents, 0 to 2 percent slopes (Durorthidic Xeric Torriorthents - fine-silty, mixed (calcareous), mesic)—5 percent
Inclusion 2: Xeric Torriorthents, 0 to 2 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), mesic)—5 percent
Inclusion 3: Aeric Halaquepts, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—5 percent

Tulase Soil

Positions on landscape: Inset fans, fan skirts
Parent material: Silty alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, crested wheatgrass, bluebunch wheatgrass
Typical profile:
0 to 5 inches—silt loam; platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 70 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 9.2 to 12.6 inches
Water supplying capacity: 8 to 10 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—swales on inset fans; contrasting feature—silty clay loam throughout the profile; distinctive present vegetation—Wyoming big sagebrush, bluebunch wheatgrass
Inclusion 2: Position on landscape—margins of inset fans; contrasting features—loamy throughout the profile, does not have a layer of silica cementation; distinctive present vegetation—Wyoming big sagebrush, bluebunch wheatgrass
Inclusion 3: Position on landscape—adjacent to alluvial flat remnants; contrasting features—salt- and sodium-affected throughout the profile, somewhat poorly drained; distinctive present vegetation—black greasewood, basin big sagebrush, basin wildrye

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 152)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Moderate—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IIc, irrigated, and VIc, nonirrigated
Range site symbol: 025X019N

TABLE 152.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Tulase	1	2	3
Bluebunch wheatgrass	AGSP	10-40	10-40	10-40	---
Thurber needlegrass	STTH2	10-40	10-40	10-40	---
Basin wildrye	ELCI2	5-15	5-15	5-15	5-10
Indian ricegrass	ORHY	2-10	2-10	2-10	2-5
Webber ricegrass	ORWE	2-10	2-10	2-10	---
Bluegrass	POA++	2-10	2-10	2-10	---
Bottlebrush squirreltail	SIHY	---	---	---	2-5
Other perennial grasses	PPGG	5-10	5-10	5-10	2-5
Thelypody	THELY	---	---	---	2-4
Globemallow	SPHAE	---	---	---	1-2
Other perennial forbs	PPFF	5-10	5-10	5-10	1-2
Big sagebrush	ARTR2	10-15	10-15	10-15	---
Black greasewood	SAVE4	---	---	---	20-30
Basin big sagebrush	ARTRT*	---	---	---	10-25
Spiny hopsage	GRSP	---	---	---	5-15
Other shrubs	SSSS	5-15	5-15	5-15	2-10
Range site symbol		025X019N	025X019N	025X019N	024X022N
Potential production (lb/acre):					
Favorable years		800	800	800	800
Normal years		600	600	600	600
Unfavorable years		400	400	400	350

1203—Tulase-Bubus-McConnel association

Map Unit Setting

Positions on landscape: Fan skirts, basin floors
Elevation: 5,700 to 6,000 feet
Climatic data (average annual):
Precipitation—about 8 inches
Air temperature—about 48 degrees F
Frost-free season—about 100 days

Composition

Tulase silt loam, 2 to 8 percent slopes (Durorthidic Xeric Torriorthents - coarse-silty, mixed (calcareous), mesic)—40 percent
Bubus very fine sandy loam, slightly saline-alkali, 2 to 8 percent slopes (Durorthidic Torriorthents - coarse-loamy, mixed (calcareous), mesic)—30 percent
McConnel loam, 0 to 4 percent slopes (Xerollic Camborthids - sandy-skeletal, mixed, mesic)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Xeric Torriorthents, 0 to 2 percent slopes—10 percent
Inclusion 2: Duric Camborthids, 0 to 2 percent slopes—5 percent

Tulase Soil

Positions on landscape: Fan skirts
Parent material: Silty alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, bluebunch wheatgrass
Typical profile:
0 to 5 inches—silt loam; platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 70 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 9.2 to 12.6 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow to medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Bubus Soil

Positions on landscape: Alluvial flat remnants
Parent material: Mixed alluvium that is high in content of pyroclastic material
Slope features: Length—short; shape—slightly concave
Dominant present vegetation: Shadscale, bud sagebrush, Indian ricegrass
Typical profile:
0 to 9 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - ML; estimated AASHTO classification - A-4
9 to 29 inches—stratified fine sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - ML; estimated AASHTO classification - A-4
29 to 49 inches—stratified fine sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; very strongly alkaline (pH 9.4); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification - ML; estimated AASHTO classification - A-4
49 to 60 inches or more—stratified sand to gravelly loamy sand; 15 to 40 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.4); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 15 to 30); estimated Unified classification - SM; estimated AASHTO classification - A-1, A-2
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 49 inches—moderate; below this depth—very rapid
Available water capacity: 7.8 to 9.0 inches
Water supplying capacity: 5 to 8 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.49; T value—4; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential frost action: Low

McConnel Soil

Positions on landscape: Offshore bars
Parent material: Loamy alluvium influenced by loess over mixed beach sediment
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, Thurber needlegrass
Typical profile:
0 to 13 inches—loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - ML; estimated AASHTO classification - A-4
13 to 60 inches or more—stratified very gravelly coarse sand to extremely gravelly loamy sand; 0 to 15 percent cobbles and stones and 65 to 90 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification - GP; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: In the upper 17 inches—moderately rapid; below this depth—very rapid
Available water capacity: 3.2 to 4.5 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (upper layer): K value—0.37; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—on-fan drainageways; contrasting features—loamy throughout the profile, does not have a layer of silica cementation; distinctive present vegetation—Wyoming big sagebrush, Thurber needlegrass
Inclusion 2: Position on landscape—inset fans dissecting alluvial flat remnants; contrasting feature—strongly saline upper layer; distinctive present vegetation—black greasewood, shadscale

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 153)

Elements of Wildlife Habitat

Suitability of Tulase soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor
Suitability of Bubus soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor
Suitability of McConnel soil for named elements:
Grain and seed crops (irrigated)—poor
Domestic grasses and legumes (irrigated)—poor
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—very poor
Shallow water areas—very poor

Ratings for Selected Uses

Tulase Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Bubus Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid
Roadfill: Good
Daily cover for landfill: Fair—thin layer
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—piping, excess salt
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

McConnel Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty
Roadfill: Good
Daily cover for landfill: Poor—seepage, too sandy, small stones

TABLE 153.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Tulase	Bubus	McConnel	1	2
Thurber needlegrass	STTH2	20-30	---	20-30	---	20-30
Bluebunch wheatgrass	AGSP	5-10	---	5-10	---	5-10
Indian ricegrass	ORHY	2-5	5-15	2-5	---	2-5
Pine bluegrass	POSC	2-5	---	2-5	---	2-5
Bottlebrush squirreltail	SIHY	2-5	5-10	2-5	7-10	2-5
Bluegrass	POA++	---	2-5	---	---	---
Inland saltgrass	DIST	---	---	---	T-2	---
Basin wildrye	ELCI2	---	---	---	T-2	---
Other perennial grasses	PPGG	2-10	---	2-10	---	2-10
Globemallow	SPHAE	2-3	2-3	2-3	---	2-3
Miterwort	NITRO	---	---	---	2-3	---
Other perennial forbs	PPFF	5-10	2-4	5-10	T-3	5-10
Wyoming big sagebrush	ARTRW*	15-20	---	15-20	---	15-20
Downy rabbitbrush	CHVIP	2-5	---	2-5	---	2-5
Shadscale	ATCO	---	30-35	---	30-40	---
Bud sagebrush	ARSP5	---	25-30	---	5-10	---
Black greasewood	SAVE4	---	---	---	20-30	---
Seepweed	SUAED	---	---	---	5-15	---
Other shrubs	SSSS	2-8	2-5	2-8	---	2-8
Range site symbol		024X005N	024X002N	024X005N	024X003N	024X005N
Potential production (lb/acre):						
Favorable years		800	700	800	600	800
Normal years		600	450	600	450	600
Unfavorable years		400	300	400	300	400

Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess salt
Sand: Probable source
Gravel: Probable source

Interpretive Groups

Capability classification: Tulase soil—IIIe, irrigated, and VIc, nonirrigated; Bubus soil—IIIe, irrigated, and VIIc, nonirrigated; McConnel soil—IVe, irrigated, and VIIc, nonirrigated

Range site symbol: Tulase soil—024X005N; Bubus soil—024X002N; McConnel soil—024X005N

1232—Perwick-Tulase association

Map Unit Setting

Positions on landscape: Low hills
Elevation: 5,100 to 5,900 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Perwick gravelly loam, 4 to 15 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), mesic)—45 percent
Tulase silt loam, 2 to 8 percent slopes (Durorthidic Xeric Torriorthents - coarse-silty, mixed (calcareous), mesic)—40 percent
Contrasting inclusions as follows:
Inclusion 1: Durorthidic Torriorthents, 2 to 15 percent slopes (Durorthidic Torriorthents - fine-silty, mixed (calcareous), mesic)—5 percent
Inclusion 2: Durixerollic Haplargids, 2 to 15 percent slopes (Durixerollic Haplargids - loamy-skeletal, mixed, mesic)—5 percent
Inclusion 3: Perwick very gravelly loam, 15 to 30 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), mesic)—5 percent

Perwick Soil

Positions on landscape: Crests and side slopes of low hills
Parent material: Kind—residuum; source—calcareous siltstone
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, black sagebrush, rabbitbrush, basin wildrye
Typical profile:
0 to 5 inches—gravelly loam; 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-4
5 to 18 inches—gravelly loam, gravelly silt loam; 25 to 50 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-4
18 to 36 inches—fine sandy loam, sandy loam; 10 to 20 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-2, A-4
36 inches—weathered bedrock
Range in depth to bedrock: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 4.5 to 5.6 inches
Water supplying capacity: 8 to 9 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.32; T value—2; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Tulase Soil

Positions on landscape: Inset fans between low hills
Parent material: Silty alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, crested wheatgrass, bluebunch wheatgrass
Typical profile:
0 to 5 inches—silt loam; platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 70 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 9.2 to 12.6 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow to medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—adjacent to channels on inset fans; contrasting feature—silty

clay loam throughout the profile; distinctive present vegetation—basin wildrye, basin big sagebrush
Inclusion 2: Position on landscape—foot slopes of low hills; contrasting features—very gravelly, layer of clay accumulation; distinctive present vegetation—Wyoming big sagebrush, black sagebrush, bluebunch wheatgrass
Inclusion 3: Position on landscape—convex side slopes of low hills; contrasting features—35 to 60 percent of surface covered with pebbles, slopes of 15 to 30 percent; distinctive present vegetation—Utah juniper, big sagebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 154)

Elements of Wildlife Habitat

Suitability of Perwick soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Suitability of Tulase soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Perwick Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock
Shallow excavations: Moderate—depth to rock, slope
Local roads and streets: Moderate—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Tulase Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Perwick soil—VIIs, nonirrigated; Tulase soil—IIIe, irrigated, and VIc, nonirrigated
Range site symbol: Perwick soil—025X025N; Tulase soil—025X019N

TABLE 154.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Perwick	Tulase	1	2	3
Indian ricegrass	ORHY	10-30	2-10	---	2-10	X
Bottlebrush squirreltail	SIHY	5-10	---	2-5	---	---
Bluebunch wheatgrass	AGSP	---	10-40	---	10-40	X
Thurber needlegrass	STTH2	---	10-40	---	10-40	X
Basin wildrye	ELCI2	---	5-15	50-60	5-15	X
Webber ricegrass	ORWE	---	2-10	---	2-10	---
Bluegrass	POA++	---	2-10	---	2-10	X
Inland saltgrass	DIST	---	---	2-5	---	---
Western wheatgrass	AGSM	---	---	5-10	---	---
Mat muhly	MURI	---	---	2-5	---	---
Needleandthread	STCO4	---	---	---	---	X
Other perennial grasses	PPGG	10-20	5-10	2-5	5-10	X
Povertyweed	IVAX	---	---	1-2	---	---
Tapertip hawksbeard	CRAC2	---	---	---	---	X
Other perennial forbs	PPFF	---	5-10	2-3	5-10	X
Black sagebrush	ARARN	5-15	---	---	---	---
Wyoming big sagebrush	ARTRW*	10-25	---	---	---	X
Big sagebrush	ARTR2	---	10-15	---	10-15	---
Black greasewood	SAVE4	---	---	2-5	---	---
Rubber rabbitbrush	CHNA2	---	---	2-5	---	---
Basin big sagebrush	ARTRT*	---	---	15-20	---	---
Rabbitbrush	CHRYS9	---	---	---	---	X
Utah juniper	JUOS	---	---	---	---	X
Other shrubs	SSSS	2-5	5-15	2-4	5-15	X
Range site symbol		025X025N	025X019N	024X006N	025X019N	---
Woodland site symbol		---	---	---	---	025X059N
Potential production (lb/acre):						
Favorable years		200	800	1,500	800	200
Normal years		150	600	1,100	600	150
Unfavorable years		100	400	600	400	100

1233—Perwick-Puett-Tulase association

Map Unit Setting

Positions on landscape: Inset fans, low hills
Elevation: 5,200 to 6,000 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 48 degrees F
Frost-free season—about 100 days

Composition

Perwick gravelly loam, 15 to 50 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), mesic)—40 percent
Puett gravelly loam, 15 to 50 percent slopes (Xeric Torriorthents - loamy, mixed (calcareous), mesic, shallow)—35 percent
Tulase silt loam, 2 to 8 percent slopes (Durorthidic Xeric Torriorthents - coarse-silty, mixed (calcareous), mesic)—15 percent
Contrasting inclusions as follows:
Inclusion 1: Badland—7 percent
Inclusion 2: Pineval gravelly loam, 4 to 15 percent slopes (Durixerollic Haplargids - loamy-skeletal, mixed, mesic)—3 percent

Perwick Soil

Positions on landscape: Lower side slopes of low hills
Parent material: Kind—residuum; source—consolidated lakebed sediment, siltstone
Slope features: Length—short; shape—slightly convex
Dominant present vegetation: Utah juniper, Wyoming big sagebrush, black sagebrush, rabbitbrush, basin wildrye
Typical profile:
0 to 3 inches—gravelly loam; 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-4
3 to 16 inches—gravelly loam, gravelly silt loam; 25 to 50 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-4
16 to 26 inches—fine sandy loam, sandy loam; 10 to 20 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-2, A-4
26 inches—weathered bedrock
Range in depth to bedrock: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 4.5 to 5.6 inches
Water supplying capacity: 8 to 9 inches
Runoff: Medium to rapid
Hydrologic group: C
Erosion factors (upper layer): K value—0.32; T value—2; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Puett Soil

Positions on landscape: Crests and upper side slopes of low hills
Parent material: Kind—residuum; source—tuff, shale, siltstone, sandstone
Slope features: Length—short; shape—convex
Dominant present vegetation: Utah juniper, big sagebrush, Indian ricegrass
Typical profile:
0 to 5 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-4
5 to 17 inches—coarse sandy loam, gravelly loam, sandy loam; 10 to 50 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM, ML, GM; estimated AASHTO classification - A-1, A-2, A-4
17 inches—weathered bedrock
Range in depth to bedrock: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderately rapid
Available water capacity: 2.1 to 2.5 inches
Water supplying capacity: 8 to 9 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (upper layer): K value—0.24; T value—1; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low

Potential frost action: Low

Tulase Soil

Positions on landscape: Inset fans between low hills
Parent material: Silty alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, bluebunch wheatgrass
Typical profile:
0 to 5 inches—silt loam; platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 70 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 9.2 to 12.6 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow to medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—convex erosional side slopes of low hills; contrasting feature—exposed semiconsolidated geologic material; distinctive present vegetation—barren
Inclusion 2: Position on landscape—summits and side slopes of adjacent fan piedmont remnants; contrasting features—layer of clay accumulation, very gravelly throughout the profile; distinctive present vegetation—big sagebrush, grasses

Major Uses

Rangeland, woodland, wildlife habitat

Potential Native Plant Community (Table 155)

Woodland

Perwick Soil

Site index for common trees: Utah juniper—20
Most important native understory plants: Big sagebrush, Indian ricegrass, bluebunch wheatgrass

Puett Soil

Site index for common trees: Utah juniper—20
Most important native understory plants: Black sagebrush, Indian ricegrass, big sagebrush

Elements of Wildlife Habitat

Suitability of Perwick soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Coniferous plants (nonirrigated)—poor
Shrubs (nonirrigated)—fair
Suitability of Puett soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Coniferous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—poor
Suitability of Tulase soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Perwick Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—small stones, erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Puett Soil

Suitability and limitations for the following uses:
Rangeland seeding: Poor—droughty, erodes easily
Roadfill: Poor—depth to rock, slope
Daily cover for landfill: Poor—depth to rock, slope
Shallow excavations: Severe—depth to rock, slope
Local roads and streets: Severe—slope
Pond reservoir areas: Severe—depth to rock, slope
Embankments, dikes, and levees: Severe—seepage, piping, thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Tulase Soil

Suitability and limitations for the following uses:
Rangeland seeding: Moderate—too arid
Roadfill: Good

TABLE 155.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Perwick	Puett	Tulase	1	2
Bluebunch wheatgrass	AGSP	X	X	10-40	---	10-40
Thurber needlegrass	STTH2	X	X	10-40	---	10-40
Basin wildrye	ELCI2	X	X	5-15	---	5-15
Indian ricegrass	ORHY	X	X	2-10	---	2-10
Needleandthread	STCO4	X	X	---	---	---
Bluegrass	POA++	X	X	2-10	---	2-10
Webber ricegrass	ORWE	---	---	2-10	---	2-10
Other perennial grasses	PPGG	X	X	5-10	---	5-10
Tapertip hawksbeard	CRAC2	X	X	---	---	---
Other perennial forbs	PPFF	X	X	5-10	---	5-10
Wyoming big sagebrush	ARTRW*	X	X	---	---	---
Rabbitbrush	CHRYS9	X	X	---	---	---
Utah juniper	JUOS	X	X	---	---	---
Big sagebrush	ARTR2	---	---	10-15	---	10-15
Other shrubs	SSSS	X	X	5-15		5-15
Range site symbol		---	---	025X019N	BARREN	025X019N
Woodland site symbol		025X059N	025X059N	---	---	---
Potential production (lb/acre):						
Favorable years		200	200	800	---	800
Normal years		150	150	600	---	600
Unfavorable years		100	100	400	---	400

Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Perwick soil—VIIe, nonirrigated; Puett soil—VIIe, nonirrigated; Tulase soil—IIIe, irrigated, and VIc, nonirrigated
Range site symbol: Tulase soil—025X019N
Woodland suitability group: Perwick soil—3r; Puett soil—3r

1281—Wendane silt loam, frequently flooded

Map Unit Setting

Positions on landscape: Alluvial flats
Elevation: 5,600 to 5,700 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Wendane silt loam, frequently flooded, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—85 percent
Contrasting inclusions as follows:
Inclusion 1: Aquic Torriorthents, 0 to 2 percent slopes—5 percent
Inclusion 2: Typic Torriorthents, 0 to 2 percent slopes—5 percent
Inclusion 3: Typic Camborthids, 0 to 2 percent slopes—5 percent

Wendane Soil

Positions on landscape: Alluvial flats
Parent material: Silty alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Alkali sacaton, basin wildrye, inland saltgrass, black greasewood, rabbitbrush
Typical profile:
0 to 12 inches—silt loam; platy structure; soft, very friable; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 50 to 80); estimated Unified classification - ML; estimated AASHTO classification - A-4
12 to 19 inches—silt loam, very fine sandy loam; subangular blocky structure; slightly hard, very friable; very strongly alkaline (pH 9.2); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 46 to 80); estimated Unified classification - ML; estimated AASHTO classification - A-4
19 to 60 inches or more—stratified silt loam to clay loam; massive; hard, friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 46) estimated Unified classification - ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: In February through July—30 to 42 inches; rest of year—below 42 inches
Hazard of flooding: Frequency—frequent; duration—brief to long; months—February through June
Permeability: Moderately slow
Available water capacity: 10.9 to 12.6 inches
Water supplying capacity: 6 to 9 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: High

Contrasting Inclusions

Inclusion 1: Position on landscape—slightly higher alluvial flat remnants; contrasting feature—moderately saline throughout the profile; distinctive present vegetation—black greasewood, shadscale
Inclusion 2: Position on landscape—smooth lower part of fan skirts adjacent to the upper margins of alluvial flats; contrasting feature—slightly salt- and sodium-affected throughout the profile; distinctive present vegetation—basin wildrye, basin big sagebrush
Inclusion 3: Position on landscape—smooth upper part of fan skirts adjacent to the margins of alluvial flats; contrasting feature—moderately salt- and sodium-affected throughout the profile; distinctive present vegetation—black greasewood, shadscale, bottlebrush squirreltail

Major Uses

Current uses: Rangeland, wildlife habitat,
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 156)

Elements of Wildlife Habitat

Suitability for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—fair

Ratings for Selected Uses

Suitability and limitations for the following uses:
Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Poor—low strength
Daily cover for landfill: Poor—excess salt, excess sodium
Shallow excavations: Moderate—wetness, flooding
Local roads and streets: Severe—flooding, frost action
Pond reservoir areas: Moderate—seepage

TABLE 156.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Wendane	1	2	3
Basin wildrye	ELCI2	40-60	T-2	50-60	T-2
Alkali sacaton	SPAI	15-30	---	---	---
Inland saltgrass	DIST	5-10	T-2	2-5	T-2
Bottlebrush squirreltail	SIHY	---	7-10	2-5	7-10
Western wheatgrass	AGSM	---	---	5-10	---
Mat muhly	MURI	---	---	2-5	---
Other perennial grasses	PPGG	2-4	---	2-5	---
Povertyweed	IVAX	1-2	---	1-2	---
Miterwort	NITRO	---	2-3	---	2-3
Other perennial forbs	PPFF	2-4	T-3	2-3	T-3
Black greasewood	SAVE4	5-15	20-30	2-5	20-30
Rubber rabbitbrush	CHNA2	2-5	---	2-5	---
Shadscale	ATCO	---	30-40	---	30-40
Bud sagebrush	ARSP5	---	5-10	---	5-10
Seepweed	SUAED	---	5-15	---	5-15
Basin big sagebrush	ARTRT*	---	---	15-20	---
Other shrubs	SSSS	2-5	---	2-4	---
Range site symbol		024X007N	024X003N	024X006N	024X003N
Potential production (lb/acre):					
Favorable years		1,900	600	1,500	600
Normal years		1,400	450	1,100	450
Unfavorable years		800	300	600	300

Embankments, dikes, and levees: Severe—excess salt, excess sodium

Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IVw, irrigated, and VIIw, nonirrigated

Range site symbol: 024X007N

1282—Wendane-Playas association

Map Unit Setting

Positions on landscape: Alluvial flats, playas
Elevation: About 5,600 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Wendane silt loam, occasionally flooded, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—70 percent
Playas—15 percent
Contrasting inclusions as follows:
Inclusion 1: Aquic Durorthidic Torriorthents, 0 to 2 percent slopes (Aquic Durorthidic Torriorthents - fine-silty, mixed (calcareous), mesic)—5 percent
Inclusion 2: Wendane silt loam, frequently flooded, 0 to 2 percent slopes (Aeric Halaquepts - fine-silty, mixed (calcareous), mesic)—5 percent
Inclusion 3: Typic Torripsamments fine sand, 4 to 30 percent slopes (Typic Torripsamments - mixed, mesic)—5 percent

Wendane Soil

Positions on landscape: Alluvial flats
Parent material: Silty alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, alkali rabbitbrush, seepweed
Typical profile:
0 to 12 inches—silt loam; platy structure; soft, very friable; very strongly alkaline (pH 9.2); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 50 to 80); estimated Unified classification - ML; estimated AASHTO classification - A-4
12 to 19 inches—silt loam, very fine sandy loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 46 to 80); estimated Unified classification - ML; estimated AASHTO classification - A-4
19 to 60 inches or more—stratified silt loam to clay loam; massive; hard, friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 46); estimated Unified classification - ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: In February through July—30 to 48 inches; rest of year—more than 48 inches
Hazard of flooding: Frequency—occasional; duration—brief to long; months—February through June
Permeability: Moderately slow
Available water capacity: 10.9 to 12.6 inches
Water supplying capacity: 6 to 9 inches
Runoff: Very slow to ponded
Hydrologic group: C
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential frost action: High

Playas

Positions on landscape: Irregularly shaped, isolated sink areas
Slope features: Length—short; shape—slightly concave
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1: Position on landscape—slightly higher lake plain remnants adjacent to alluvial flats; contrasting feature—moderately saline; distinctive present vegetation—alkali sacaton, inland saltgrass, pickleweed
Inclusion 2: Position on landscape—lower part of alluvial flats adjacent to playas; contrasting feature—frequent flooding; distinctive present vegetation—basin wildrye, inland saltgrass, alkali rabbitbrush
Inclusion 3: Position on landscape—sand dunes on alluvial flats; contrasting features—sandy throughout the profile, excessively drained; distinctive present vegetation—Indian ricegrass, spiny hopsage, fourwing saltbush, horsebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 157)

Elements of Wildlife Habitat

Suitability of Wendane soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor
Shrubs (nonirrigated)—very poor
Wetland plants—poor
Shallow water areas—fair

Ratings for Selected Uses

Wendane Soil

Suitability and limitations for the following uses:

TABLE 157.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Wendane	Playas	1	2	3
Basin wildrye	ELCI2	5-15	---	T-5	40-60	---
Inland saltgrass	DIST	5-10	---	T-15	5-10	---
Alkali sacaton	SPAI	---	---	40-70	15-30	---
Indian ricegrass	ORHY	---	---	---	---	10-20
Needleandthread	STCO4	---	---	---	---	5-10
Other perennial grasses	PPGG	T-4	---	2-5	2-4	2-5
Povertyweed	IVAX	---	---	---	1-2	---
Other perennial forbs	PPFF	T-4	---	2-5	2-4	2-5
Black greasewood	SAVE4	60-75	---	2-5	5-15	20-30
Iodinebush	ALOC2	---	---	10-20	---	---
Nuttall saltbush	ATNU2	---	---	5-10	---	---
Rubber rabbitbrush	CHNA2	---	---	---	2-5	---
Hairy horsebrush	TECO2	---	---	---	---	2-5
Spiny horsebrush	TESP2	---	---	---	---	2-5
Fourwing saltbush	ATCA2	---	---	---	---	2-5
Other shrubs	SSSS	5-10	---	2-5	2-5	5-10
Range site symbol		024X011N	BARREN	024X010N	024X007N	027X016N
Potential production (lb/acre):						
Favorable years		500	---	450	1,900	300
Normal years		350	---	300	1,400	200
Unfavorable years		200	---	150	800	50

Rangeland seeding: Poor—too arid, excess salt, excess sodium
Roadfill: Poor—low strength
Daily cover for landfill: Poor—excess salt, excess sodium
Shallow excavations: Moderate—wetness, flooding
Local roads and streets: Severe—flooding, frost action
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—excess salt, excess sodium
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Wendane soil—IVw, irrigated, and VIIw, nonirrigated; Playas—VIIIw, nonirrigated
Range site symbol: Wendane soil—024X011N

1291—Perwick Variant association

Map Unit Setting

Positions on landscape: Fan skirts
Elevation: 5,700 to 6,100 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 47 degrees F
Frost-free season—about 100 days

Composition

Perwick Variant gravelly loam, 2 to 8 percent slopes (Xeric Torriorthents - loamy-skeletal, mixed (calcareous), mesic)—75 percent
Perwick Variant gravelly loam, 8 to 15 percent slopes (Xeric Torriorthents - loamy-skeletal, mixed (calcareous), mesic)—15 percent
Contrasting inclusion as follows:
Inclusion 1: Xeric Torriorthents, 8 to 30 percent slopes (Xeric Torriorthents - loamy-skeletal, carbonatic, mesic)—10 percent

Perwick Variant, Gently Sloping to Moderately Sloping, Soil

Positions on landscape: Lower summits of fan skirts
Parent material: Mixed, calcareous alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, Thurber needlegrass
Typical profile:
0 to 9 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM, SM-SC; estimated AASHTO classification - A-4
9 to 60 inches or more—stratified extremely gravelly loam to very gravelly loamy sand; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification - GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 3.7 to 5.5 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow to medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.28; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Perwick Variant, Strongly Sloping, Soil

Positions on landscape: Upper summits of fan skirts
Parent material: Mixed, calcareous alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, Thurber needlegrass
Typical profile:
0 to 9 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - SM, SM-SC; estimated AASHTO classification - A-4
9 to 60 inches or more—stratified extremely gravelly loam to very gravelly loamy sand; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification - GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderately rapid
Available water capacity: 3.7 to 5.5 inches
Water supplying capacity: 8 to 10 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.28; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusion

Inclusion 1: Position on landscape—upper part of fan skirts adjacent to mountains; contrasting feature—higher lime content throughout the profile; distinctive present vegetation—black sagebrush, Indian ricegrass, needleandthread

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 158)

Elements of Wildlife Habitat

Suitability of Perwick Variant, gently sloping to moderately sloping, soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Suitability of Perwick Variant, strongly sloping, soil for named elements:
Grain and seed crops (irrigated)—fair
Domestic grasses and legumes (irrigated)—fair
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Wetland plants—poor
Shallow water areas—very poor

Ratings for Selected Uses

Perwick Variant, Gently Sloping to Moderately Sloping, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action
Pond reservoir areas: Severe—slope, seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

TABLE 158.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		Inclusion number--
		Perwick Variant, gently to moderately sloping	Perwick Variant, strongly sloping	1
Thurber needlegrass	STTH2	20-30	20-30	20-30
Bluebunch wheatgrass	AGSP	5-10	5-10	5-10
Indian ricegrass	ORHY	2-5	2-5	2-5
Pine bluegrass	POSC	2-5	2-5	2-5
Bottlebrush squirreltail	SIHY	2-5	2-5	2-5
Other perennial grasses	PPGG	2-10	10-20	2-10
Globemallow	SPHAE	2-3	2-3	2-3
Other perennial forbs	PPFF	5-10	5-10	5-10
Wyoming big sagebrush	ARTRW*	15-20	15-20	15-20
Downy rabbitbrush	CHVIP	2-5	2-5	2-5
Other shrubs	SSSS	2-8	10-20	2-8
Range site symbol		024X005N	024X005N	024X005N
Potential production (lb/acre):				
Favorable years		800	900	800
Normal years		600	700	600
Unfavorable years		400	400	400

Perwick Variant, Strongly Sloping, Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action, slope
Pond reservoir areas: Severe—slope, seepage
Embankments, dikes, and levees: Severe—seepage
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Perwick Variant, gently sloping to moderately sloping, soil—IIIe, irrigated, and VIIc, nonirrigated; Perwick Variant, strongly sloping, soil—IVe, irrigated, and VIIc, nonirrigated
Range site symbol: 024X005N

1352—Cortez-Tenvorrd association

Map Unit Setting

Positions on landscape: Fan piedmonts
Elevation: 5,400 to 6,200 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Cortez silt loam, 4 to 15 percent slopes (Xerollic Nadurargids - fine, montmorillonitic, mesic)—50 percent
Tenvorrd silt loam, 4 to 15 percent slopes (Xerollic Durorthids - loamy, mixed, mesic, shallow)—35 percent
Contrasting inclusions as follows:
Inclusion 1: Durorthidic Xeric Torriorthents, 2 to 15 percent slopes (Durorthidic Xeric Torriorthents - coarse-silty, mixed (calcareous), mesic)—10 percent
Inclusion 2: Xerollic Durorthids, 15 to 50 percent slopes (Xerollic Durorthids - loamy-skeletal, mixed, mesic)—5 percent

Cortez Soil

Positions on landscape: Summits of fan piedmont remnants
Parent material: Thin deposits of loess over mixed alluvium
Slope features: Length—short; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, Douglas rabbitbrush, cheatgrass, Sandberg bluegrass
Typical profile:
0 to 11 inches—silt loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification - ML; estimated AASHTO classification - A-4
11 to 24 inches—clay; 15 to 25 percent pebbles (by weight); prismatic structure; hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification - CH; estimated AASHTO classification - A-7
24 to 42 inches—indurated hardpan
Range in depth to hardpan: 22 to 29 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—very slow
Available water capacity: 3.9 to 4.9 inches
Water supplying capacity: 7.5 to 10.0 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.55; T value—2; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Tenvorrd Soil

Positions on landscape: Upper side slopes and shoulders of fan piedmont remnants
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—convex
Dominant present vegetation: Wyoming big sagebrush, Douglas rabbitbrush, cheatgrass, Sandberg bluegrass
Typical profile:
0 to 9 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, CL; estimated AASHTO classification - A-4, A-6
9 to 19 inches—loam, silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, CL; estimated AASHTO classification - A-4, A-6
19 to 40 inches—indurated hardpan
Range in depth to hardpan: 10 to 20 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 3.1 to 3.7 inches
Water supplying capacity: 7 to 8 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (upper layer): K value—0.55; T value—1; wind erodibility group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Contrasting Inclusions

Inclusion 1: Position on landscape—inset fans; contrasting features—very deep, silty throughout the profile, does not have a silica-cemented hardpan; distinctive present vegetation—Wyoming big

sagebrush, Douglas rabbitbrush, cheatgrass, Sandberg bluegrass

Inclusion 2: Position on landscape—middle and lower side slopes of fan piedmont remnants; contrasting features—slopes of more than 15 percent, moderately deep to a silica-cemented hardpan, does not have a layer of clay accumulation; distinctive present vegetation—Utah juniper, big sagebrush

Major Uses

Rangeland, wildlife habitat

Potential Native Plant Community (Table 159)

Elements of Wildlife Habitat

Suitability of Cortez soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Suitability of Tenvorrd soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Cortez Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, excess sodium
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan, hard to pack

TABLE 159.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Cortez	Tenvorrd	1	2
Bluebunch wheatgrass	AGSP	10-40	10-40	X	10-40
Thurber needlegrass	STTH2	10-40	10-40	X	10-40
Basin wildrye	ELCI2	5-15	5-15	X	5-15
Indian ricegrass	ORHY	2-10	2-10	X	2-10
Webber ricegrass	ORWE	2-10	2-10	---	2-10
Bluegrass	POA++	2-10	2-10	X	2-10
Needleandthread	STCO4	---	---	X	---
Other perennial grasses	PPGG	5-10	5-10	X	5-10
Tapertip hawksbeard	CRAC2	---	---	X	---
Other perennial forbs	PPFF	5-10	5-10	X	5-10
Big sagebrush	ARTR2	10-15	10-15	---	10-15
Wyoming big sagebrush	ARTRW*	---	---	X	---
Rabbitbrush	CHRYS9	---	---	X	---
Utah juniper	JUOS	---	---	X	---
Other shrubs	SSSS	5-15	5-15	X	5-15
Range site symbol		025X019N	025X019N	---	025X019N
Woodland site symbol		---	---	025X059N	---
Potential production (lb/acre):					
Favorable years		800	800	200	800
Normal years		600	600	150	600
Unfavorable years		400	400	100	400

Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—low strength, shrink-swell
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—hard to pack, excess salt, thin layer
Sand: Probable source
Gravel: Probable source

Tenvorrd Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty, erodes easily
Roadfill: Poor—cemented pan
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Severe—cemented pan
Pond reservoir areas: Severe—cemented pan, slope
Embankments, dikes, and levees: Severe—piping, thin layer
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: IVe, irrigated, and VIIs, nonirrigated
Range site symbol: 025X019N

1411—Pineval-Tulase-Perwick association

Map Unit Setting

Positions on landscape: Fan-piedmont remnants, inset fans, low hills
Elevation: 5,100 to 5,900 feet
Climatic data (average annual):
Precipitation—about 9 inches
Air temperature—about 48 degrees F
Frost-free season—about 100 days

Composition

Pineval gravelly loam, 4 to 15 percent slopes (Durixerollic Haplargids - loamy-skeletal, mixed, mesic)—35 percent
Tulase silt loam, 2 to 4 percent slopes (Durorthidic Xeric Torriorthents - coarse-silty, mixed (calcareous), mesic)—30 percent
Perwick gravelly loam, thick surface, 4 to 15 percent slopes (Xeric Torriorthents - coarse-loamy, mixed (calcareous), mesic)—25 percent
Contrasting inclusions as follows:
Inclusion 1: Puett gravelly loam, 8 to 30 percent slopes (Xeric Torriorthents - loamy, mixed (calcareous), mesic, shallow)—5 percent
Inclusion 2: Ricert sandy loam, 2 to 8 percent slopes (Duric Natrargids - fine-loamy, mixed, mesic)—3 percent
Inclusion 3: Durorthidic Xeric Torriorthents, 8 to 15 percent slopes (Durorthidic Xeric Torriorthents - coarse-silty, mixed (calcareous), mesic)—2 percent

Pineval Soil

Positions on landscape: Summits of fan piedmont remnants
Parent material: Kind—alluvium; source—basalt, rhyolite
Slope features: Length—long; shape—smooth to convex
Dominant present vegetation: Wyoming big sagebrush, basin wildrye, Sandberg bluegrass
Typical profile:
0 to 3 inches—gravelly loam; 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - CL-ML, GM-GC; estimated AASHTO classification - A-4
3 to 11 inches—very gravelly clay loam, very gravelly loam, very gravelly sandy clay loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GC; estimated AASHTO classification - A-2
11 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly sand; 50 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification - GP-GM, GM; estimated AASHTO classification - A-1
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: Rare
Permeability: Moderately slow
Available water capacity: 3.1 to 4.3 inches
Water supplying capacity: 7 to 9 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.28; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Tulase Soil

Positions on landscape: Inset fans
Parent material: Silty alluvium influenced by loess and volcanic ash
Slope features: Length—short; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, basin wildrye, rabbitbrush, Sandberg bluegrass
Typical profile:
0 to 5 inches—silt loam; platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
5 to 70 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - CL-ML; estimated AASHTO classification - A-4
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Moderate
Available water capacity: 9.2 to 12.6 inches
Water supplying capacity: 8 to 10 inches
Runoff: Slow to medium
Hydrologic group: B
Erosion factors (upper layer): K value—0.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low

Corrosivity: To steel—high; to concrete—low
Potential frost action: Moderate

Perwick Soil

Positions on landscape: Side slopes of low hills
Parent material: Kind—residuum; source—consolidated lake sediment, siltstone
Slope features: Length—long; shape—smooth to slightly concave
Dominant present vegetation: Black sagebrush, Indian ricegrass, spiny hopsage
Typical profile:
0 to 5 inches—gravelly loam; 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-4
5 to 18 inches—gravelly loam, gravelly silt loam; 25 to 50 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - GM-GC, SM-SC; estimated AASHTO classification - A-4
18 to 36 inches—fine sandy loam, sandy loam; 10 to 20 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification - SM; estimated AASHTO classification - A-2, A-4
36 inches—unweathered bedrock
Range in depth to bedrock: 20 to 40 inches
Depth to seasonal high water table: More than 60 inches
Hazard of flooding: None
Permeability: Above the bedrock—moderate
Available water capacity: 4.5 to 5.6 inches
Water supplying capacity: 8 to 9 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (upper layer): K value—0.32; T value—2; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential frost action: Low

Contrasting Inclusions

Inclusion 1: Position on landscape—convex side slopes of low hills; contrasting feature—shallow to bedrock; distinctive present vegetation—black sagebrush
Inclusion 2: Position on landscape—lower summits of fan piedmont remnants; contrasting feature—moderately salt- and sodium-affected layer of clay accumulation; distinctive present vegetation—shadscale, bud sagebrush
Inclusion 3: Position on landscape—higher inset fans and fan aprons; contrasting features—very deep, silty throughout the profile, slopes of 8 to 15 percent; distinctive present vegetation—Wyoming big sagebrush, bluegrass

Major Uses

Current uses: Rangeland, wildlife habitat
Potential foreseeable use: Irrigated cropland if irrigation water is made available

Potential Native Plant Community (Table 160)

Elements of Wildlife Habitat

Suitability of Pineval soil for named elements:
Wild herbaceous plants (nonirrigated)—poor
Shrubs (nonirrigated)—poor
Suitability of Tulase soil for named elements:
Grain and seed crops (irrigated)—good
Domestic grasses and legumes (irrigated)—good
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair
Wetland plants—poor
Shallow water areas—very poor
Suitability of Perwick soil for named elements:
Wild herbaceous plants (nonirrigated)—fair
Shrubs (nonirrigated)—fair

Ratings for Selected Uses

Pineval Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid, droughty
Roadfill: Good
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—slope, flooding, frost action
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—seepage
Sand: Probable source
Gravel: Probable source

Tulase Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Good
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—piping

TABLE 160.--RANGELAND PLANTS AND WOODLAND UNDERSTORY

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Pineval	Tulase	Perwick	1	2	3
Bluebunch wheatgrass	AGSP	10-40	10-40	---	---	---	10-40
Thurber needlegrass	STTH2	10-40	10-40	---	---	---	10-40
Basin wildrye	ELCI2	5-15	5-15	---	---	---	5-15
Indian ricegrass	ORHY	2-10	2-10	10-30	10-30	5-15	2-10
Webber ricegrass	ORWE	2-10	2-10	---	---	---	2-10
Bluegrass	POA++	2-10	2-10	---	---	2-5	2-10
Bottlebrush squirreltail	SIHY	---	---	5-10	5-10	5-10	---
Other perennial grasses	PPGG	5-10	5-10	10-20	10-20	---	5-10
Globemallow	SPHAE	---	---	---	---	2-3	---
Other perennial forbs	PPFF	5-10	5-10	---	---	2-4	5-10
Big sagebrush	ARTR2	10-15	10-15	---	---	---	10-15
Black sagebrush	ARARN	---	---	5-15	5-15	---	---
Wyoming big sagebrush	ARTRW*	---	---	10-25	10-25	---	---
Shadscale	ATCO	---	---	---	---	30-35	---
Bud sagebrush	ARSP5	---	---	---	---	25-30	---
Other shrubs	SSSS	5-15	5-15	2-5	2-5	2-5	5-15
Range site symbol		025X019N	025X019N	025X025N	025X025N	024X002N	025X019N
Potential production (lb/acre):							
Favorable years		800	800	200	200	700	800
Normal years		600	600	150	150	450	600
Unfavorable years		400	400	100	100	300	400

Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Perwick Soil

Suitability and limitations for the following uses:
Rangeland seeding: Fair—too arid
Roadfill: Poor—depth to rock
Daily cover for landfill: Poor—depth to rock
Shallow excavations: Moderate—depth to rock, slope
Local roads and streets: Moderate—slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—piping
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Interpretive Groups

Capability classification: Pineval soil—VIs, nonirrigated; Tulase soil—IIe, irrigated, and VIIe, nonirrigated; Perwick soil—VIIs, nonirrigated
Range site symbol: Pineval soil—025X019N; Tulase soil—025X019N; Perwick soil—025X025N

1500—Playas

Map Unit Setting

Positions on landscape: Basin floors
Elevation: About 5,600 feet
Climatic data (average annual):
Precipitation—about 7 inches
Air temperature—about 48 degrees F
Frost-free season—about 110 days

Composition

Playas—100 percent

Playas

Positions on landscape: Sink areas of basin floors
Parent material: Lacustrine sediment veneered by fine textured sediment or eolian sand
Slope features: Length—long; shape—plane
Dominant present vegetation: Barren
Reference profile:
0 to 60 inches or more—silty clay loam, clay, silty clay
Depth to seasonal high water table: Variable
Hazard of flooding: Frequency—frequent; duration—brief to long; months—September through July
Permeability: Very slow
Runoff: Ponded
Hydrologic group: D

Major Uses

None

Interpretive Groups

Capability classification: VIIIw, nonirrigated

Prime Farmland

In this section, prime farmland is defined and discussed and the prime farmland soils in this survey area are listed.

Prime farmland is of major importance in providing the nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, state, and federal levels, as well as individuals, must encourage and facilitate the wise use of our nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to producing food, seed, forage, fiber, and oilseed crops. Such soils have properties that are favorable for the economic production of sustained high yields of crops. The soils need only to be treated and managed using acceptable farming methods. Adequate moisture and a sufficiently long growing season are required. Prime farmland soils produce the highest yields with minimal units of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils either are used for producing food or fiber or are available for these uses. Urban or built-up land and water areas cannot be considered prime farmland.

Prime farmland soils commonly get an adequate and dependable supply of moisture from precipitation or irrigation. Temperature and growing season are favorable, and level of acidity or alkalinity is acceptable. The soils have few, if any, rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not flooded during the growing season. The slope ranges mainly from 0 to 6 percent.

Soils that have a high water table, are subject to flooding, or are droughty may qualify as prime farmland soils if the limitations are overcome by drainage, flood control, or irrigation. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More information on the criteria for prime farmland soils can be obtained at the local office of the Soil Conservation Service.

A recent trend in land use has been the conversion of prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on lands that are less productive than prime farmland.

The following map units meet the soil requirements for prime farmland when irrigated. On some soils included in the list, measures should be used to overcome a hazard or limitation, such as flooding, wetness, or droughtiness. The location of each map unit is shown on the detailed soil maps at the back of this publication. Soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

100 Wholan silt loam, cool, occasionally flooded
121 Piltdown fine sandy loam
141 Pedoli-Poorcal association
142 Pedoli-Shipley association
143 Pedoli-Silverado association
190 Broyles silt loam, cool, 0 to 2 percent slopes
192 Broyles-Ricert association
241 Humboldt loam, drained, slightly saline, rarely flooded
260 Shipley fine sandy loam, occasionally flooded, 0 to 4 percent slopes
351 Fenster silt loam, nonsaline-alkali, frequently flooded
352 Fenster-Jesse Camp association
440 Akercan loam
590 Hayeston sandy loam, 0 to 4 percent slopes
610 Needle Peak silt loam, occasionally flooded
620 Silverado sandy loam, 2 to 8 percent slopes
621 Silverado sandy loam, 0 to 2 percent slopes
630 Jesse Camp silt loam
671 Whirlo gravelly loam, 2 to 8 percent slopes
672 Whirlo-Creemon association
721 Paranat silt loam, drained, occasionally flooded
770 Welch loam, drained, 0 to 4 percent slopes
771 Welch gravelly silt loam, drained, 2 to 8 percent slopes
821 Enko loam, 0 to 2 percent slopes
841 Kodra loam, 0 to 4 percent slopes
922 Handy loam, 2 to 8 percent slopes
1010 Bubus loam, 0 to 2 percent slopes
1060 Allker gravelly sandy loam, 2 to 8 percent slopes
1202 Tulase silt loam, 0 to 2 percent slopes

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Leland Campsey and Edward Petersen, soil conservationists, Soil Conservation Service, helped to write this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the yields of the main crops and hay and pasture plants are discussed.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Resource management systems are a combination of interrelated conservation practices and management techniques used to arrest or prevent deterioration and maintain the productive capability of the soil. This means that soil erosion as well as other factors that may influence the sustained productive use of the resource are within acceptable limits.

Soils may differ in management needs; however, there are basic essential practices that apply to all soils that are cultivated. These management practices are discussed in the following paragraphs.

Conservation cropping systems.—A conservation cropping system is a system used to grow crops in rotation in combination with needed cultural and management practices that improve the soil and that more than offset soil depleting crops. The system should protect the soil from erosion and maintain or improve fertility and physical condition. Such a system should include perennial legumes, grass-legume mixtures, or other crops that produce large quantities of residue to compensate for crops in the rotation that produce little or no residue.

Adequate fertilizer should be used to maintain or improve soil fertility. Tillage operations should be limited to those that are essential for seedbed preparation and weed control. To avoid compaction and maintain tilth, they should be timed to coincide with the proper soil moisture condition.

A typical cropping system for this survey area is 6 to 8 years of alfalfa and 2 years of small grain. Small grain residue is usually returned to the soil. Alfalfa is usually seeded early in spring on tilled soil. Some alfalfa is seeded with oats in the second year of the grain rotation. The oats are then used as a nurse crop, and the stubble is retained to provide protection from erosion.

Irrigation water management.—Irrigation water management is the application of irrigation water at rates that maximize crop production and minimize soil and water loss. Optimum irrigation efficiency is obtained by

applying water to meet the needs of the crop without waste or erosion.

An efficient distribution system is one that has the capacity to meet the needs of the crops and is located and controlled so that seepage and evaporation loss are minimized. Control structures may be needed to facilitate the handling of water.

The design of an irrigation system is governed by the method of irrigation to be used and the expected efficiency in applying water.

To apply water efficiently, the irrigator needs to know the available water capacity of the soil, the rate that water enters and moves through the soil, and the amount of water required by the crop. Most crops should be irrigated when 40 to 50 percent of the available moisture in the top half of the root zone has been used. Except when reclaiming saline-alkali soils, applications of irrigation water should be adjusted to the available water capacity of the soil, the water intake rate, and the crop needs to avoid overirrigating, leaching of plant nutrients, and raising the level of the water table.

Management of saline soils.—As with most soils in arid and subarid regions, many soils in this survey area contain small quantities of soluble salts and sodium. Because rainfall is low and the rate of evaporation is high, soil moisture is insufficient to leach salts out of the root zone. In some soils a high concentration of salts and sodium limit or prevent the growth of crops. In addition, many low-lying areas receive salt-laden water from runoff or seepage. Surface evaporation of this water generally results in an increase of soluble salts on or in the soils. In some areas that have a high water table, water rises in the soil by capillary action and carries dissolved salts with it. The soluble salts are readily dissolved in water and can be moved to any part of the soil profile.

A soil that contains excessive amounts of soluble salts is called a saline soil. One that contains excessive amounts of sodium is called an alkali soil. A soil that contains excessive amounts of both soluble salts and sodium is a saline-alkali soil.

Saline phases of several of the soils in the survey area have been mapped. The map unit name may not give the degree to which these soils are affected, nor does it indicate that they contain both salts and sodium. This information is given in the map unit descriptions. Three saline and alkali classes are used as soil phases. These classes are—

1. Soils that are essentially free of excess salts and sodium and contain less than 0.15 percent salts. The conductivity of the saturation extract is less than 4 millimhos per centimeter at 25 degrees C, and the content of exchangeable sodium is less than 15 percent.

2. Slightly saline-alkali soils that contain 0.15 to 0.35 percent salts, or the conductivity of the saturation extract is 4 to 8 millimhos per centimeter at 25 degrees C. The content of exchangeable sodium is 15 to 20 percent for soils that are moderately coarse, medium, moderately fine, and fine textured.

3. Strongly saline-alkali soils that contain more than 0.65 percent salts, or the conductivity of the saturation extract is more than 16 millimhos per centimeter at 25 degrees C. The content of exchangeable sodium is more than 25 percent for soils that are moderately coarse, medium, moderately fine, and fine textured.

Although a distinct gap occurs between the second and third classes, an intermediate or moderate class is not needed in this survey area because only a few of the samples analyzed were moderately saline-alkali.

Some soils mapped as slightly saline-alkali are free of excess salts and sodium in the upper 4 or 5 inches, but they contain slight or moderate concentrations just below a depth of 1 foot. Several soils mapped as strongly saline-alkali are only slightly affected in the upper 4 to 5 inches.

Soils differ in the kinds of salt they contain and in the practices needed for their improvement. For this reason, each soil requires individual treatment; however, some general guidelines can be given.

A good supply of irrigation water and adequate drainage must be provided to reclaim any saline soil. The most common method of applying water for reclamation is to level the areas to a uniform grade and then to flood them between border dikes. If drainage is adequate and large amounts of water are used, this method is effective in leaching the soluble salts out of the root zone.

Application of plant nutrients.—Most crops in the survey area respond to solid or liquid fertilizer. Specific fertilizer requirements are based on soil sampling or plant tissue analysis. Application of phosphorus and nitrogen increases production of small grain and aids in establishing alfalfa. Established alfalfa, unless seeded in combination with grass, usually only needs applications of phosphorus.

Erosion control.—Erosion control is needed to prevent excessive wearing away of the soil surface by wind and water. Protection of the upper layer is important because it contains most of the organic matter and generally is more fertile than the lower layers. Wind erosion can be controlled by leaving plant cover on the soil surface during critical periods of the year. Tillage should be held to a minimum during windy periods. Control of erosion by water generally is accomplished by leveling to a proper irrigation grade and applying water at the proper rate.

Pasture management.—Proper pasture management involves using a grazing system that maintains a prolonged stand of high quality grasses and legumes while protecting the soil from erosion and reducing water loss.

Two biological systems, plants and animals, are included in the management program. Their needs can best be met by implementing a rotation grazing system of several pastures that will allow for irrigation, drying, and regrowth in each pasture during the grazing cycle.

Grazing when pastures are too wet results in compaction, a decrease in the water intake rate, and deterioration of soil structure and plant species.

Increased yields commonly are obtained by use of commercial fertilizer. Weeds generally are controlled by mowing or applying selective herbicides. Droppings of manure can be spread with a drag in spring.

The frequency of irrigation should vary according to soil texture, daylight hours, temperature, plant growth, and vigor. Irrigate before the soil moisture is depleted below 50 percent of the available water capacity.

Hayland management.—Proper hayland management helps to ensure the prolonged life of desirable forage plants, maintain or improve their quality, protect the soil, and reduce water loss.

Hayland in the survey area is used for growing alfalfa, as native meadows, or for improved meadows. High quality certified inoculated seed of locally adapted species produce the highest yields during the relatively short growing season. Again, the frequency and amount of irrigation water to be applied depend on the available water capacity of the soil, the rate of evapotranspiration, and the needs of the crop grown. In some areas the amount and timing of water applications is controlled by spring runoff. The species used for pasture should be governed by the amount and timing of water applications.

Land leveling, grading, shaping, and subsoiling or disking should be completed before final seedbed preparation.

An annual crop should be grown for a year before establishing alfalfa fields.

Yields generally are increased by the application of fertilizer. Alfalfa should be harvested at about one-tenth bloom or when new crown buds are 1.0 inch to 1.5 inches long in order to produce forage of the best quality.

Aftermath grazing can be used in fall or winter. Leave a stubble height of 3 to 4 inches for protection from erosion. Plants should not be grazed late in winter or early in spring, when they have started new growth. Grazing at this time depletes nutrient reserves in the roots, which can damage the stand and reduce forage production.

Drainage.—Land adjacent to flood plains of perennial and intermittent streams usually has a seasonal high water table from December to July. This water table rises in fall, when evapotranspiration decreases, and is at a maximum height during peak runoff periods in spring. Soils that are flooded naturally or by seasonal irrigation may need surface drainage in order to meet production goals.

Field ditch mains or laterals are needed in order to dispose of excess surface or subsurface water, intercept ground water, control the level of the ground water, provide for leaching of saline or alkali soils, or various combinations of these objectives.

Native meadows can be improved by controlling water, spot grading and shaping, using borrow material from outside the field to fill flow areas, overseeding the field with adapted high-production plant species, establishing contour ditch systems for improved irrigation efficiency, properly managing irrigation water, and applying commercial fertilizer at rates indicated by soil tests and adequate to meet production goals.

As a general rule, native meadows should not be plowed out or otherwise have all of the existing vegetation destroyed. Because of the soil characteristics and climate in these areas, it is extremely difficult to reestablish vegetation in these areas.

Rangeland

About 95 percent of the survey area is rangeland. Almost all of the agricultural income is derived from livestock, principally cattle. Cow-calf-steer operations are dominant, but cow-calf-steer-yearling operations are also conducted. Ranches are as much as 28,000 acres in size. Most of the grazing in the area is on land administered by the Bureau of Land Management, but some is on land administered by the Forest Service.

On many ranches the forage produced on rangeland is supplemented by aftermath grazing on hayland and small grain stubble fields in fall. In winter the native forage is supplemented by hay. Creep feeding of calves and yearlings to increase their market weight is practiced on some ranches.

In areas that have similar climate and topography, the kind and amount of vegetation produced on rangeland are closely related to the kinds of soil. Effective management is based on the relationship between the soils and vegetation and water.

A table in each detailed map unit description gives the grasses, forbs, and shrubs that make up the potential native plant community on the unit by common name and scientific symbol; the percentage composition of each species on each major soil and contrasting inclusion; and the total annual production of vegetation in favorable, normal, and unfavorable years.

The *percentage composition* is the expected percentage of the total annual production. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Total production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make

growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Dry weight is the total annual yield per acre reduced to a common percentage of air-dry moisture.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range condition. Range condition is determined by comparing the present plant community with the potential natural plant community on a particular range site. The more closely the existing community resembles the potential community, the better the range condition. Range condition is an ecological rating only. It does not have a specific meaning that pertains to the present plant community in a given use.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for the site. Such management generally results in the optimum production of vegetation, conservation of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Grazing management should be at an intensity that maintains enough cover to protect the soil and maintains or improves the quantity and quality of desirable vegetation. This management applies to all grazing animals, including livestock, game animals, and wild horses.

The most practical and efficient way to achieve good management of livestock grazing is with planned grazing systems. This involves a system in which two or more grazing units are alternately rested from grazing in a planned sequence over a period of years. The rest period should extend at least through the growing season of the key plants. The important feature is that the same unit is not grazed at the same time year after year.

Planned grazing systems should be designed to fit the individual operating unit but still meet management objectives. To provide uniform distribution of grazing, practices such as using livestock watering developments, fencing, salting, or constructing livestock trails may be needed.

Sometimes it is feasible to use practices that accelerate range improvement. Good grazing management needs to be applied in conjunction with these practices.

Brush management should be applied when less desirable woody species increase to amounts in excess of what is natural for the site. This practice can be effectively planned and applied to benefit both livestock and wildlife while reducing sedimentation and improving watershed quality.

Use of chemicals is effective in brush management. When chemicals are applied according to the manufacturer's recommendations and at the proper time, good results can be expected. There must be adequate desirable plant species in the understory to respond to the treatment.

Prescribed burning is another brush management practice available. It is relatively inexpensive but requires precautions. Its success requires a good understory to provide fuel, and proper timing of the burning is critical. It is not so selective as chemical treatment.

Mechanical treatment practices such as plowing, chaining, or beating are effective on certain sites, but the cost is high.

Range seeding should be applied when the range has deteriorated to a point where desired plant species have disappeared. Sites to be seeded should be evaluated on the basis of the soil, climate, topography, and planned use to determine the species that are adapted and seeding techniques that can be used.

Even though adapted species and improved techniques are applied, successful results of seeding in this survey area are strongly influenced by rainfall. Precipitation fluctuates drastically from one year to the next even in the higher rainfall zones. The success of range seeding depends on the amount of moisture available during the growing season. Each soil is rated in the detailed map units for rangeland seeding. Criteria used to develop these ratings are listed in the Appendix.

Woodland Management

Roy Kaiser, range conservationist, Soil Conservation Service, helped to prepare this section.

The information in this section can be used by woodland owners or forest managers in planning the use of soils for wood crops.

There are four woodland types in this survey area. These are (1) juniper with big sagebrush understory, (2) pinyon-juniper with big sagebrush understory, (3) pinyon-juniper with black sagebrush understory, and (4) aspen. The common understory species expected to be present in these woodland types are given in the tables in the section "Detailed Soil Map Units."

In areas of juniper-big sagebrush woodland, Utah juniper dominates the tree canopy. Big sagebrush, with scattered rabbitbrush, is the principal understory shrub. Associated grasses are bluebunch wheatgrass, Thurber needlegrass, Indian ricegrass, basin wildrye, Sandberg bluegrass, and pine bluegrass. When the tree canopy is 10 to 20 percent, the composition of the understory plants is about 50 percent grasses, 20 percent forbs, and 30 percent shrubs and young trees. Average understory production ranges from about 500 pounds per acre in favorable years to about 200 pounds per acre in

unfavorable years, when the tree canopy is 10 to 20 percent.

Areas of this woodland require protection from wildfire and accelerated soil erosion. Proper grazing management practices are needed, including clearcutting of Utah juniper in small patches to enhance forage production or selective harvesting of juniper trees for posts and fuelwood. Production of fuelwood ranges from 2 to 6 cords per acre, and 10 to 20 posts can be produced in a mature stand with a tree canopy of 10 to 20 percent.

This woodland type is mainly in the hills near the north end of Pine Valley. It is used by deer, small upland game animals, and various birds as shelter and food sources.

In areas of pinyon-juniper-big sagebrush woodland, singleleaf pinyon pine and Utah juniper dominate the tree canopy. Big sagebrush is the dominant understory shrub, but smaller amounts of snowberry and rabbitbrush are also present. Bluebunch wheatgrass, basin wildrye, Thurber needlegrass, Sandberg bluegrass, and pine bluegrass are the most extensive understory grasses. When the tree canopy is 10 to 20 percent, the composition of the understory vegetation is about 60 percent grasses, 15 percent forbs, and 25 percent shrubs. Understory production ranges from about 500 pounds per acre in favorable years to about 200 pounds per acre in unfavorable years when the tree canopy is 10 to 20 percent. It includes production of all plant species in the understory up to a height of 4.5 feet above the ground surface.

This woodland requires protection from wildfire and accelerated soil erosion. Proper grazing management is essential.

Clearcutting in small patches, using a controlled burning program, thinning, and selective cuttings are suitable management practices. These practices can improve forage production, increase production of wood products, and maintain a desirable canopy of trees.

Mature pinyon-juniper stands yield 2 to 6 cords of fuelwood per acre. With a canopy of 10 to 20 percent, 10 to 20 juniper posts and 5 to 10 pinyon Christmas trees can be harvested per acre. In the better stands, pinyon can yield about 200 pounds of nuts per acre in favorable years.

This woodland type is on most of the hills and mountains and on some upper fan piedmonts in the survey area. It has high value as habitat for mule deer in winter. Pinyon and juniper provide shelter from winter storms, and juniper can be used as browse. The pinyon jay is dependent upon pinyon for survival.

The pinyon-juniper-black sagebrush woodland has a tree canopy dominated by singleleaf pinyon pine and Utah juniper. Black sagebrush is the principal understory shrub, but smaller amounts of downy rabbitbrush are also present. Bluebunch wheatgrass, Thurber needlegrass, Indian ricegrass, Sandberg bluegrass, and pine bluegrass are important associated grass species. When the average tree canopy ranges from 10 to 20 percent, the composition of the understory vegetation is about 50 percent grasses, 15 percent forbs, and 35 percent shrubs. Average understory production ranges from about 400 pounds per acre in favorable years to about 150 pounds per acre in unfavorable years under a tree canopy of 10 to 20 percent. This includes production of all plant species in the understory up to a height of 4.5 feet above the ground surface.

The essential requirements, management practices, yields, and wildlife habitat values generally are the same as those in the pinyon-juniper-big sagebrush woodland areas.

This woodland type is on hills and mountains in the southern part of the survey area.

The aspen woodland type is composed of one to several aspen clones, each with a common genetic makeup and individual phenological and physiological characteristics. Dominant understory shrubs are snowberry and currant species. Mountain brome, slender wheatgrass, and bluegrass species are common associated grasses, and meadowrue, horsemint, and groundsel are common associated forbs. When the tree canopy is 15 to 35 percent, the composition of the understory is about 20 percent grasses, 35 percent forbs, and 45 percent shrubs and young trees. Average understory production ranges from about 800 pounds per acre in favorable years to about 400 pounds per acre in unfavorable years when the canopy cover is 15 to 35 percent. This includes production of all plant species in the understory up to a height of 4.5 feet above the ground surface.

This woodland type should be protected from high intensity fires and accelerated soil erosion, and proper grazing management practices should be applied.

Clearcutting small blocks of quaking aspen on a rotation of 60 to 80 years can provide a healthy and productive stand. Less than 200 board feet of sawtimber per acre can be harvested. The potential fuelwood production is 4 to 8 cords per acre from these low producing stands.

This woodland type provides food and cover for deer, grouse, and various nongame species.

Woodland Understory Vegetation

Understory vegetation consists of grasses, forbs, shrubs, and other plants. Some woodland, if well managed, can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the trees.

The quantity and quality of understory vegetation vary with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, and the depth and condition of the litter. The density of the canopy determines the amount of light that understory plants receive.

The potential for producing understory vegetation is given for each soil suitable for woodland use in the tables in the section "Detailed Soil Map Units." An *X* in the tables indicates that the named plant occurs in the understory when the canopy density is most nearly typical of woodland in which the production of wood crops is highest.

The total production of understory vegetation includes the herbaceous plants and the leaves, twigs, and fruit of woody plants up to a height of 4.5 feet. It is expressed in pounds per acre of air-dry vegetation in favorable, normal, and unfavorable years. In a favorable year, soil moisture is above average during the optimum part of the growing season; in a normal year, soil moisture is average; and in an unfavorable year, it is below average.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, hold snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To insure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Planting windbreaks in this survey area is limited. Although windbreaks are desirable for protecting livestock and buildings, any windbreak planting in the area needs to be irrigated.

Species adapted to the specific soils should be selected. Those suited to deep, well drained soils include Fremont cottonwood (male), Siberian elm, Scotch pine, and cotoneaster. Cottonwood, Russian-olive, golden willow, silver buffaloberry, and redosier dogwood are suited to wet soils. Species adapted to saline-alkali soils include Siberian elm, Russian-olive, silver buffaloberry, and fourwing saltbush. Species suited to shallow soils include Rocky Mountain juniper, common chokeberry, cotoneaster, and blue spruce.

Information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension Service or from a nursery.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

Wildlife is a valuable resource in the survey area. It provides opportunities for such outdoor activities as hunting and fishing.

Wildlife is a product of the soil and, like other crops, responds to good management. The level of production of adapted wildlife usually is in balance with essential habitat containing food and cover. Most managed wildlife habitat is created, improved, or maintained by planting suitable vegetation, by manipulating existing vegetation to bring about the natural establishment of desired plants, or by a combination of both. The complete habitat elements needed by specific species of wildlife generally require several kinds of soil and a combination of land uses.

In the following paragraphs the general soil map units of the survey area are described as wildlife areas that differ in potential for wildlife species and in environmental factors.

Wildlife area 1 consists of general soil map units 1 and 2. The soils in this area are nearly level and are on basin floors and semibolson floors. This area is suited to a wide variety of wildlife because of the amount of water available, the meadow-type vegetation, and the scattered patches of willows on the poorly drained soils; the big sagebrush and basin wildrye on the better drained soils; and the black greasewood and saltgrass in the salt- and alkali-affected areas.

Wildlife species in this area include beaver, cottontail, jackrabbit, mule deer, sage grouse, quail, coyote, and bobcat. Hungarian partridge often winter in the northern part of the survey area. Most of the wildlife is dependent on the meadows. Sage grouse, for example, bring their young to the meadows to feed on insects. Management therefore should be directed toward improving or maintaining the meadows. Proper use of areas for pasture and range is needed to avoid accelerated stream entrenchment and deterioration of the habitat. Some of the streams in this area support trout, dace, shiners, and suckers.

Wildlife area 2 consists of general soil map units 3 through 15. This area is on fan skirts, fan aprons, alluvial fans, fan piedmonts, ballenas, and low hills. The native vegetation is variable. It includes areas of some pinyon and juniper, big sagebrush and grass, black greasewood, bud sagebrush and shadscale, and black sagebrush and grass. Because of a shortage of water, the kinds and number of wildlife in the area are relatively few.

Wildlife species in this area include jackrabbit, coyote, and bobcat. A few mule deer and Hungarian partridge use this area in winter. The availability of water is the main concern for management of wildlife in this area.

Wildlife area 3 consists of general soil map units 16 through 19. This area is on strongly sloping to very steep, high mountainsides. The native vegetation is mostly pinyon, juniper, and big sagebrush and an understory of bluebunch wheatgrass and Idaho fescue. The drainageways need to be preserved because they are the main source of surface water.

Included in this area are small wet meadows, snow pockets that support quaking aspen, and ridges that support low sagebrush. These areas are significant to the overall potential for habitat, and good management is needed. The small meadows need to be protected from gullying and the resulting deterioration. Proper range use is needed to maintain the habitat.

Wildlife species in this area include mule deer, sage grouse, chukar, jackrabbit, cottontail, coyote, bobcat, and some beaver on the canyon bottoms.

Recreation

Restrictive soil features such as wetness, slope, and texture of the surface layer are considered when evaluating a particular site for recreational development. Susceptibility to flooding is considered. The location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines should be considered. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

Camp areas, picnic areas, playgrounds, and paths and trails need special attention.

Camp areas require such site preparation as shaping and leveling for tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils for this use have mild slopes and are not wet or subject to flooding during the period of use. The surface has few if any stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that will increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones or boulders, is firm after rains, and is not dusty when dry. It shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

Paths and trails for hiking, horseback riding, and other uses should require little or no cutting and filling. The best soils for these uses are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the annual period of use. They should have moderate slopes and have few or no stones or boulders on the surface.

Engineering

In the section "Detailed Soil Map Units" information for planning land uses related to urban development and to water management is provided. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following selected uses: roadfill; daily cover for landfill; shallow excavations; local roads and streets; pond reservoir areas; embankments, dikes, and levees; sand; and gravel. The ratings are based on observed performance of the soils and on estimated data given in the map unit descriptions. Information on other uses can be obtained from the local offices of the Soil Conservation Service.

The information is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings. The criteria used to determine the ratings are provided in the Appendix, which contains criteria extracted from the National Soils Handbook *(20)*. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high

water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, and earthfill; (7) plan ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the map unit descriptions, along with the soil maps and taxonomic unit descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features are given in the section "Detailed Soil Map Units."

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties given in the map unit descriptions include the range of grain-size distribution, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area are given in the detailed map unit descriptions. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the system adopted by the American Association of State Highway and Transportation Officials *(1)* and the Unified soil classification system *(2)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments ranging from 2 millimeters in diameter to larger than 3 inches are indicated as a percentage of the total soil on a dry-weight basis. Cobbles and stones are larger than 3 inches in diameter, and pebbles are 2 millimeters to 3 inches in diameter. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. The estimates are rounded to the nearest 5 percent.

Physical and Chemical Properties

Estimates of some characteristics and features that affect soil behavior are given in the detailed map unit descriptions. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in total inches of water for the soil profile. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the map unit descriptions. Salinity affects the suitability of a soil for rangeland seeding and crop production, the stability of the soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodicity is a measure of exchangeable sodium in the soil at saturation. It is expressed as a sodium adsorption ratio (SAR), or the ratio of sodium to calcium plus magnesium. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The sodicity of irrigated soils is affected by the quality of irrigation water and management of the soil. Hence, the sodicity of soils in individual fields can differ greatly from the value given in the map unit descriptions. Sodicity affects the suitability of a soil for rangeland seeding and crop production and the stability of the soil if used as construction material.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, very fine sand, sand, and organic matter (up to 4 percent) and on soil structure and permeability. The estimates are modified by the presence of rock fragments. Values of K range from 0.02 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion and the amount of soil lost. Soils are grouped according to the amount of stable aggregates 0.84 millimeters in size. These are represented idealistically by USDA textural classes. Soils containing rock fragments can occur in any group.

1. Sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Loamy soils that are less than 20 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Loamy soils that are 20 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.

7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to wind erosion.

The *hazard of erosion* is an estimate of erosion of the bare soil surface by water and wind. The hazard of erosion by water is determined on the basis of erosion factor K and percent slope. The hazard of erosion by wind is determined on the basis of the stability of the soil surface and the climate. The guidelines used in estimating the hazard of erosion are given in the Appendix.

Soil and Water Features

Estimates of various soil and water features are given in the detailed map unit descriptions. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

The frequency and duration of flooding and the time of year when flooding is most likely is given in the map unit descriptions.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. The depth to the seasonal high water table is indicated in the map unit descriptions. A water table that is seasonally high for less than 1 month is not indicated.

Only saturated zones within a depth of about 6 feet are indicated.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping.

Cemented pans are cemented or indurated subsurface layers within a depth of 5 feet. Such pans cause difficulty in excavation. Pans are classified as thin or thick. A *thin* pan is less than 3 inches thick if continuously indurated or less than 18 inches thick if discontinuous or fractured. Excavations can be made by trenching machines, backhoes, or small rippers. A *thick* pan is more than 3 inches thick if continuously indurated or more than 18 inches thick if discontinuous or fractured. Such a pan is so thick or massive that blasting or special equipment is needed in excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(18)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 165 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Aridisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Orthid (*Orth*, meaning true, plus *id*, from Aridisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Camborthids. (*Camb*, meaning change, plus *orthid*, the suborder of the Aridisols).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Camborthids.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is loamy-skeletal, mixed, mesic Typic Camborthids.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual (17)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (18)*. Unless otherwise stated, colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Ados Series

The Ados series consists of soils that are moderately deep to a hardpan. The soils are well drained and moderately permeable. They are on lower side slopes of mountains. These soils formed in colluvium and alluvium weathered from limestone and dolomite. Slope is 4 to 15 percent. Elevation is 6,500 to 8,000 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 50 to 80 days.

Typical pedon of an Ados gravelly loam, 4 to 15 percent slopes, in an area of Hopeka-Solak-Ados association, about 14 miles southwest of Eureka, about 2,100 feet west and 2,600 feet south of the northeast corner of sec. 32, T. 18 N., R. 52 E.

A1—0 to 2 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; weak medium platy structure parting to moderate fine granular; slightly hard, friable, nonsticky and nonplastic; few very fine roots; common fine and very fine vesicular pores; 15 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 3 inches thick)

A2—2 to 4 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); gradual smooth boundary. (2 to 5 inches thick)

Bk—4 to 18 inches; light yellowish brown (10YR 6/4) very gravelly loam, yellowish brown (10YR 5/4) moist; massive; soft, friable, nonsticky and nonplastic; few medium roots and common fine and very fine roots; common fine and very fine interstitial pores; 50 percent pebbles; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (6 to 14 inches thick)

Bkq—18 to 30 inches; very pale brown (10YR 7/3) extremely gravelly loam, light yellowish brown (10YR 6/4) moist; massive; hard, firm, nonsticky and nonplastic; discontinuous weakly to strongly lime- and silica-cemented portions; few medium roots and common fine and very fine roots; common fine and very fine interstitial pores; 60 percent pebbles; violently effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary. (10 to 13 inches thick)

Bkm—30 to 39 inches; white (10YR 8/2), strongly lime-cemented, extremely gravelly hardpan with thin indurated lamella, pale brown (10YR 6/3) moist; massive; extremely hard, extremely firm; few fine interstitial pores; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (6 to 12 inches thick)

R—39 inches; fractured limestone.

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 44 to 46 degrees F. The particle-size control section averages 35 to 60 percent rock fragments. Depth to the petrocalcic horizon ranges from 20 to 34 inches. Depth to bedrock ranges from 30 to 40 inches. Reaction is moderately alkaline or strongly alkaline throughout the profile.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. Structure is platy, subangular blocky, or granular. The horizon is slightly effervescent to violently effervescent.

The Bk horizon has value of 5 or 6 when dry and 3 to 5 when moist, and it has chroma of 3 or 4. It is gravelly loam or very gravelly loam. It commonly is massive, but some profiles have weak subangular blocky structure. The horizon is strongly effervescent or violently effervescent.

The Bkq horizon has value of 6 or 7 when dry and 5 or 6 when moist, and it has chroma of 2 to 4. It is sandy loam or loam modified with 35 to 60 percent pebbles. Parts of this horizon have discontinuous weak, strong, or indurated cementation. The horizon is strongly effervescent or violently effervescent.

Ados Variant

The Ados Variant consists of soils that are moderately deep to a petrocalcic horizon. The soils are well drained and moderately permeable. They are on fan piedmonts. These soils formed in alluvium derived from limestone and calcareous shale. Slope is 2 to 8 percent. Elevation is 7,000 to 7,600 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of an Ados Variant fine sandy loam, 2 to 8 percent slopes, in an area of Ados Variant-Pie Creek Variant-Jesse Camp association, about 8 miles southwest of Eureka, about 2,000 feet east and 600 feet south of the northwest corner of sec. 3, T. 18 N., R. 52 E.

A—0 to 5 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; moderate thick platy structure; slightly hard, friable, nonsticky and slightly plastic; many fine and very fine roots; many medium and fine vesicular pores; 10 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (3 to 7 inches thick)

Bw1—5 to 8 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; hard, friable, nonsticky and slightly plastic; many fine and very fine roots; many fine interstitial pores; 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (3 to 8 inches thick)

Bw2—8 to 12 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; many fine interstitial pores; few thin lime pendants on rock fragments; 40 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (4 to 7 inches thick)

Bk—12 to 23 inches; white (10YR 8/2) very gravelly sandy loam, pale brown (10YR 6/3) moist; massive; hard, firm, nonsticky and nonplastic; few fine roots; many fine and very fine interstitial pores; few fine lime veins and thin pendants on rock fragments; 35 percent pebbles and 15 percent cobbles; strongly

effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (10 to 13 inches thick)

Bkm—23 to 37 inches; white (10YR 8/2), indurated, very gravelly, lime-cemented hardpan, pale brown (10YR 6/3) moist; massive; extremely hard, extremely firm; common fine and very fine roots matted on upper surface; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (10 to 17 inches thick)

2Ck—37 to 43 inches; very pale brown (10YR 7/3) extremely gravelly loamy sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; many fine and very fine interstitial pores; common thick lime pendants on rock fragments; 50 percent pebbles and 15 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (5 to 7 inches thick)

3C—43 to 60 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, nonsticky and slightly plastic; many fine and very fine interstitial pores; 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4).

These soils are usually dry; they are moist in winter and spring but are dry in mid-June to October. The mean annual soil temperature is 44 to 46 degrees F. Depth to the Bk horizon is 10 to 22 inches, and depth to the petrocalcic horizon is 20 to 35 inches. The particle-size control section is sandy loam or loam modified with 35 to 60 percent rock fragments. Where mixed, it averages 8 to 18 percent clay and 45 to 80 percent calcium carbonate equivalent.

The A horizon has value of 5 or 6 when dry and 4 or 5 when moist, and it has chroma of 2 or 3.

The Bw horizon has value of 6 or 7 when dry and 4 or 5 when moist.

The Bk horizon has value of 6 to 8 when dry and 4 to 6 when moist, and it has chroma of 2 or 3. The horizon has 35 to 60 percent pebbles and cobbles.

The 2Ck horizon has value of 6 to 8 when dry and 4 to 6 when moist, and it has chroma of 2 or 3. The horizon has 60 to 70 percent rock fragments, mainly pebbles and some cobbles.

The 3C horizon has 15 to 35 percent pebbles and cobbles.

The soils in this survey area in the Ados Variant differ from the soils in the Ados series because they do not have bedrock immediately below the petrocalcic horizon.

Akercan Series

The Akercan series consists of very deep, well drained, moderately permeable soils on inset fans. These soils formed in alluvium derived from various kinds of rock. Slope is 0 to 2 percent. Elevation is 6,200 to 7,000 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of Akercan loam, about 30 miles west of Eureka, about 2,540 feet west of the southeast corner of sec. 5, T. 19 N., R. 48 E.

A1—0 to 3 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; moderate thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few medium and fine roots; many fine and very fine vesicular pores; neutral (pH 7.2); abrupt smooth boundary. (2 to 4 inches thick)

A2—3 to 5 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine interstitial pores; mildly alkaline (pH 7.4); clear smooth boundary. (2 to 3 inches thick)

Bw1—5 to 8 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic, few medium roots and common fine and very fine roots; common fine and very fine interstitial pores; mildly alkaline (pH 7.6); clear wavy boundary. (0 to 4 inches thick)

Bw2—8 to 16 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium roots and common fine and very fine roots; common fine and very fine interstitial pores; moderately alkaline (pH 8.0); gradual wavy boundary. (6 to 10 inches thick)

C—16 to 21 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; common fine and very fine pores; moderately alkaline (pH 8.0); gradual wavy boundary. (5 to 8 inches thick)

Ck—21 to 49 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; common fine and very fine interstitial pores; slightly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary. (25 to 60 inches thick)

C'—49 to 60 inches; very pale brown (10YR 8/3) very fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; common fine and very fine interstitial pores; mildly alkaline (pH 7.8).

These soils are usually dry; they are moist in winter and early in spring and dry in June to October. The mean annual soil temperature is 45 to 47 degrees F. Thickness of the A and Bw horizons ranges from 10 to 22 inches. Where mixed, the particle-size control section averages 18 to 25 percent clay. The A and Bw horizons

are neutral to moderately alkaline; alkalinity increases with increasing depth.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist.

The Bw horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 3 or 4 when moist. Structure is subangular blocky or angular blocky.

The C horizon has value of 6 to 8 when dry and 4 or 5 when moist, and it has chroma of 3 or 4. Texture is loam, very fine sandy loam, fine sandy loam, or silt loam.

Akerue Series

The Akerue series consists of well drained, slowly permeable soils that are shallow to a duripan. These soils are on lower side slopes of mountains. They formed in residuum derived from andesite, rhyolite, and quartzite. Slope is 15 to 30 percent. Elevation is 6,200 to 7,000 feet. The mean annual precipitation is about l0 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 50 to 80 days.

Typical pedon of an Akerue very stony loam, 15 to 30 percent slopes, in an area of Akerue-Simpark-Robson association, about 36 miles northwest of Eureka, about 500 feet east and 200 feet south of the northwest corner of sec. 15, T. 21 N., R. 48 E.

A—0 to 6 inches; brown (10YR 5/3) very stony loam, dark brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common medium, fine, and very fine roots; many very fine interstitial pores; 20 percent pebbles and 15 percent cobbles and 10 percent stones; neutral (pH 6.8); clear wavy boundary. (4 to 6 inches thick)

Bt1—6 to 12 inches; light brown (7.5YR 6/4) extremely cobbly clay loam, dark brown (7.5YR 4/4) moist; moderate fine and very fine angular blocky structure; hard, firm, sticky and plastic; many fine and very fine roots; many fine and very fine tubular pores; common moderately thick pressure faces on peds; 20 percent pebbles and 30 percent cobbles and 10 percent stones; neutral (pH 7.0); clear wavy boundary. (4 to 7 inches thick)

Bt2—12 to 18 inches; brown (7.5YR 5/4) very cobbly clay, dark brown (7.5YR 3/4) moist; moderate medium and fine angular blocky structure; very hard, firm, very sticky and very plastic; common medium, fine, and very fine roots; common fine and very fine tubular pores; many moderately thick pressure faces on peds; 20 percent pebbles and 30 percent cobbles; neutral (pH 7.2); abrupt wavy boundary. (4 to 7 inches thick)

Bqkm—18 to 20 inches; light gray and white (10YR 7/2 and 10YR 8/1), indurated, cobbly duripan with a continuous laminar silica cap cementing the cobbles and stones, light gray, white, and very pale brown (10YR 7/2, 8/2, and 7/4) moist; massive; extremely hard; common fine roots matted on the surface of the duripan; very strongly effervescent; moderately alkaline (pH 8/2); abrupt wavy boundary. (1/2 inch to 6 inches thick)

R—20 inches; andesite.

These soils are usually dry; they are moist in winter and early in spring and dry early in June to October. The mean annual soil temperature is about 44 to 47 degrees F. Depth to the indurated duripan ranges from 14 to 20 inches. Depth to bedrock is 15 to 26 inches. The argillic horizon averages 35 to 45 percent clay modified with 35 to 60 percent rock fragments, many of which are more than 3 inches in diameter. Reaction of the A and Bt horizons is neutral or mildly alkaline; it increases with increasing depth. Some pedons have silica and lime pendants on the cobbles and stones in the lower part of the Bt horizon.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3.

The Bt horizon has hue of 7.5YR or 10YR, and it has value of 5 or 6 when dry and 3 or 4 when moist. Texture of the fine earth fraction is clay loam or clay.

Allker Series

The Allker series consists of very deep, well drained, moderately slowly permeable soils on smooth fan piedmonts. These soils formed in alluvium derived from mixed volcanic and sedimentary rocks with some influence of loess. Slope is 2 to 8 percent. Elevation is 5,500 to 6,300 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 90 to 110 days.

Typical pedon of Allker gravelly sandy loam, 2 to 8 percent slopes, about 22 miles southeast of Crescent Valley; 1,500 feet west and 2,200 feet north of the southeast corner of sec. 28, T. 26 N., R. 49 E.

A1—0 to 3 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; many coarse and medium vesicular pores; 15 percent pebbles; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 4 inches thick)

A2—3 to 7 inches; pale brown (10YR 6/3) gravelly sandy loam, yellowish brown (10YR 5/4) moist; weak thin platy structure; slightly hard, very friable, nonsticky and nonplastic; common fine and very fine roots; common medium and fine tubular and vesicular pores; 15 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (3 to 5 inches thick)

Btq—7 to 16 inches; light yellowish brown (10YR 6/4) gravelly loam, yellowish brown (10YR 5/4) moist;

moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine tubular pores; 15 percent hard, firm, brittle durinodes; common moderately thick clay films lining pores and on ped faces; 15 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (8 to 11 inches thick)

Bt—16 to 26 inches; brownish yellow (10YR 6/6) gravelly loam, yellowish brown (10YR 5/4) moist; moderate medium and fine angular blocky structure; hard, firm, sticky and plastic; common medium and fine roots; common fine and very fine tubular pores; many thick clay films lining pores and on ped faces; 15 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (9 to 14 inches thick)

Bqk—26 to 37 inches; light yellowish brown (10YR 6/4), weakly silica-cemented gravelly loam, yellowish brown (10YR 5/4) moist; moderate medium and fine angular blocky structure; hard, friable, slightly sticky and slightly plastic; few medium and fine roots; common fine and very fine tubular pores; thin discontinuous silica laminae; many moderately thick silica coatings lining pores and on ped faces; 20 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (8 to 11 inches thick)

2Bqk—37 to 60 inches; yellowish brown (10YR 5/6) very gravelly loamy sand, dark yellowish brown (10YR 4/6) moist; single grain; loose, nonsticky and nonplastic; few fine roots; common fine and very fine interstitial pores; few thin discontinuous silica laminae; 55 percent pebbles; strongly effervescent; strongly alkaline (pH 8.5).

These soils are usually dry; they are moist in winter and spring and are dry from June to October. The mean annual soil temperature is 48 to 50 degrees F. Depth to weak cementation is 22 to 30 inches. Where mixed, the upper 20 inches of the argillic horizon averages 20 to 30 percent clay, more than 35 percent medium or coarse sand, and 15 to 30 percent pebbles.

The A horizon has value of 5 or 6 when dry and 3 to 5 when moist, and it has chroma of 2 to 4.

The Bt horizon has value of 5 or 6 when dry and 4 or 5 when moist, and it has chroma of 3 to 6. It is loam or clay loam modified with 15 to 30 percent pebbles. It has subangular blocky or angular blocky structure.

The 2Bqk horizon is loamy sand or sand modified with 35 to 60 percent pebbles.

Ansping Series

The Ansping series consists of deep, well drained, moderately permeable soils on strongly dissected lower side slopes of mountains and foot slopes. These soils formed in alluvium and colluvium derived from limestone. Slope is 4 to 30 percent. Elevation is 6,500 to 8,000 feet. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of an Ansping loam, 15 to 30 percent slopes, in an area of Hymas-Ansping association, about 8 miles southwest of Eureka, about 2,600 feet east and 450 feet south of the northwest corner of sec. 15, T. 18 N., R. 52 E.

A1—0 to 8 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; many fine and very fine interstitial pores; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (5 to 10 inches thick)

A2—8 to 13 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; many fine and very fine roots; common fine and very fine interstitial pores; 10 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (5 to 7 inches thick)

Bkq1—13 to 32 inches; white (10YR 8/1) very gravelly loam, light gray (10YR 7/2) moist; massive; hard, firm, nonsticky and nonplastic; very few fine roots; few fine and very fine interstitial pores; weakly cemented with lime and silica; 55 percent lime-coated pebbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (15 to 24 inches thick)

Bkq2—32 to 43 inches; light gray (10YR 7/2) very gravelly loam, pale brown (10YR 6/3) moist; massive; hard, firm, nonsticky and nonplastic; few fine and very fine roots; common fine interstitial pores; very weakly cemented with lime and silica; 55 percent lime-coated pebbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (8 to 14 inches thick)

Bqkm—43 to 60 inches; white (10YR 8/2) strongly cemented duripan, very pale brown (10YR 7/3) moist; massive; extremely hard, very firm; violently effervescent; strongly alkaline (pH 8.6).

These soils are usually dry; they are moist in winter and spring and are dry in mid-July to October. The mean annual soil temperature is 45 to 47 degrees F. Thickness of the mollic epipedon and depth to the Bkq horizon are 10 to 13 inches. The particle-size control section averages loam or sandy loam in the fine earth fraction with 12 to 25 percent clay, and it has 50 to 75 percent pebbles. It has 40 to 60 percent calcium carbonate equivalent. Depth to the strongly cemented duripan, where present, is 40 to 55 inches.

The A horizon has value of 4 or 5 when dry, and it has chroma of 2 or 3. It has platy, granular, or subangular blocky structure.

The Bkq horizon has value of 6 to 8 when dry and 5 to 7 when moist, and it has chroma of 1, 2, or 3.

Atrypa Variant

The Atrypa Variant consists of moderately deep, well drained, moderately permeable soils on crests and side slopes of mountains. These soils formed in residuum derived from dolomite, sandstone, shale, tuff, and conglomerate. Slope is 15 to 50 percent. Elevation is 5,900 to 7,000 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of an Atrypa Variant gravelly loam, 15 to 50 percent slopes, in an area of Quarz-Highams-Atrypa Variant association, about 40 miles south of Carlin, about 1,850 feet west and 530 feet south of the northeast corner of sec. 15, T. 26 N., R. 52 E.

A1—0 to 5 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure; soft, very friable, sticky and plastic; common very fine roots; many very fine vesicular pores; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (5 to 9 inches thick)

AC—5 to 16 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; massive; slightly hard, very friable, sticky and plastic; few medium roots and many very fine and fine roots; common very fine interstitial and tubular pores; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (8 to 12 inches thick)

C—16 to 21 inches; very pale brown (10YR 7/3) gravelly loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, sticky and plastic; few medium and coarse roots and many very fine and fine roots; common very fine tubular pores; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (3 to 7 inches thick)

Cr—21 inches; soft fractured dolomite.

These soils are usually dry; they are moist in winter and spring but are dry in July to October. The mean annual soil temperature is 44 to 46 degrees F. Thickness of the mollic epipedon is 7 to 9 inches. The upper 7 inches, when mixed, has value of darker than 3.5 when moist and 5.5 when dry, and it has chroma of less than 3.5 when moist. The particle-size control section is loam that is 18 to 25 percent clay modified with 25 to 35 percent pebbles. Depth to paralithic contact is 20 to 27 inches.

The C horizon has value of 6 or 7 when dry and 4 or 5 when moist. It is massive or has subangular blocky structure.

The Atrypa Variant soils in this survey area differ from the soils in the Atrypa series because they have bedrock at a depth of 10 to 20 inches and have a calcic horizon.

Atrypa Series

The Atrypa series consists of shallow, well drained, moderately permeable soils on low side slopes of mountains. These soils formed in residuum and colluvium derived from shale. Slope is 15 to 50 percent. Elevation is 6,500 to 7,800 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 50 to 80 days.

Typical pedon of a Atrypa gravelly loam, 15 to 30 percent slopes, in an area of Atrypa-Mau association, about 20 miles north and 12 miles west of Eureka, about 275 feet west of the southeast corner of sec. 35, T. 23 N., R. 51 E.

A1—0 to 5 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; many very fine interstitial pores; 20 percent pebbles; mildly alkaline (pH 7.8); gradual smooth boundary. (4 to 6 inches thick)

A2—5 to 10 inches; grayish brown (10YR 5/2) gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; many very fine interstitial pores; 25 percent pebbles; slightly effervescent; mildly alkaline (pH 7.8); clear wavy boundary. (4 to 7 inches thick)

Bk—10 to 14 inches; light brownish gray (10YR 6/2) gravelly loam, dark grayish brown (10YR 4/2) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; many fine and very fine interstitial pores; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt irregular boundary. (3 to 7 inches thick)

Cr—14 inches; fractured shale with coating of lime in cracks.

These soils are usually dry; they are moist in winter and spring but are dry in July to October. The mean annual soil temperature is 43 to 46 degrees F. The mollic epipedon is 8 to 12 inches thick; the lower part of the profile commonly has colors dark enough to qualify as mollic, but this is because of the inherent color of the parent material rather than an increase in organic matter. The particle-size control section is loam that is 18 to 24

percent clay modified with 10 to 35 percent angular gravel-sized shale fragments. Depth to paralithic contact ranges from 11 to 20 inches. The upper part of the profile is noneffervescent or slightly effervescent, and the lower part is strongly effervescent or violently effervescent.

The A horizon has value of 3 or 4 when moist, but it averages less than 3.5 where the upper 7 inches is mixed. It has chroma of 2 or 3. Structure is subangular blocky or granular.

The Bk horizon has value of 5 to 7 when dry and 3 to 6 when moist, and it has chroma of 1 to 3. The horizon is massive or has subangular blocky structure. Texture is loam or gravelly loam.

Barrier Series

The Barrier series consists of well drained, moderately permeable soils that are shallow to a strongly cemented duripan. These soils are on fan piedmont remnants. They formed in alluvium derived from mixed volcanic and sedimentary rock. Slope is 2 to 15 percent. Elevation is 6,000 to 7,400 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Barrier fine sandy loam, 2 to 8 percent slopes, in an area of Rubyhill-Barrier association, about 15 miles northwest of Eureka, about 1,880 feet north and 660 feet west of the southeast corner of sec. 35, T. 21 N., R. 51 E.

A—0 to 5 inches; light gray (10YR 7/2) fine sandy loam, brown (10YR 5/3) moist; moderate medium platy structure; slightly hard, friable, nonsticky and nonplastic; few fine roots; many medium and fine vesicular pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (5 to 7 inches thick)

Bqk—5 to 15 inches; white (10YR 8/2) fine sandy loam, very pale brown (10YR 7/3) moist; moderate medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common medium, fine, and very fine roots; many fine and very fine interstitial pores; 15 percent durinodes; 10 percent pebbles; violently effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (5 to 13 inches thick)

Bqkm1—15 to 17 inches; white (10YR 8/1) strongly cemented duripan, light gray (10YR 7/2) moist; massive; very hard, very firm; common medium, fine, and very fine roots matted on the upper surface; few fine interstitial pores; violently effervescent; abrupt smooth boundary. (2 to 8 inches thick)

Bqkm2—17 to 45 inches; white (10YR 8/1) strongly cemented duripan layers 2 to 4 inches thick alternating with layers of weakly cemented gravelly sandy loam, light gray (10YR 7/2) moist; massive; very hard, very firm, nonsticky and nonplastic; common fine and very fine interstitial pores; 15 percent pebbles; violently effervescent; strongly alkaline (pH 8.6).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is about 45 to 47 degrees F. Depth to the duripan ranges from 10 to 20 inches. Where mixed, the fine earth fraction of the particle-size control section is sandy loam, fine sandy loam, or loam. It averages 8 to 18 percent clay and has 10 to 35 percent rock fragments.

The A horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3.

The Bqk horizon has value of 7 or 8 when dry and 5 to 7 when moist, and it has chroma of 1 to 3. The profile is strongly effervescent or violently effervescent and is moderately alkaline or strongly alkaline.

Batan Series

The Batan series consists of very deep, moderately well drained, moderately slowly permeable soils on alluvial flat remnants. These soils formed in alluvium that is high in content of loess and pyroclastic material derived mainly from volcanic rock. Slope is 0 to 2 percent. Elevation is 4,700 to 5,700 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 49 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Batan silt loam, in an area of Batan-Ocala association, about 1 mile east of Crescent Valley, about 700 feet west and 80 feet north of the southeast corner of sec. 34, T. 30 N., R. 48 E.

A—0 to 4 inches; pale brown (10YR 6/3) silt loam, yellowish brown (10YR 5/4) moist; strong thick platy structure parting to moderate very thin platy; slightly hard, friable, sticky and plastic; few very fine roots; many very fine tubular and vesicular pores; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (2 to 5 inches thick)

C—4 to 8 inches; pale brown (10YR 6/3) silty clay loam, yellowish brown (10YR 5/4) moist; weak very thick platy structure; slightly hard, friable, sticky and plastic; common fine and very fine roots; many very fine vesicular and tubular pores; strongly effervescent; very strongly alkaline (pH 9.2); abrupt smooth boundary. (3 to 6 inches thick)

Ck—8 to 17 inches; pale brown (10YR 6/3) silt loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, sticky and plastic; common very fine and fine roots and few medium roots; common very fine tubular pores and few very fine vesicular pores; few fine lime filaments; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (7 to 12 inches thick)

Cqk1—17 to 23 inches; pale brown (10YR 6/3) silty clay loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, very sticky and plastic; weak discontinuous silica cementation; few medium roots and common fine and very fine roots; common very fine tubular pores; few fine lime filaments; manganese concretions present in variable amounts; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (6 to 9 inches thick)

Cqk2—23 to 37 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; few fine distinct reddish yellow (7.5YR 6/6) iron mottles, dark brown (10YR 4/4) moist; weak thin platy structure; 70 percent discontinuous weak silica cementation; few medium, fine, and very fine roots; common very fine tubular pores; common fine and medium soft lime masses and common fine and medium lime filaments; common fine and medium gypsum crystals; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (7 to 14 inches thick)

Cqk3—37 to 45 inches; pale brown (10YR 6/3) silt loam, yellowish brown (10YR 5/4) moist; common fine distinct reddish brown (5YR 4/4) iron mottles, dark reddish brown (5YR 3/3) moist; weak thin platy structure; hard, firm, sticky and plastic; weak discontinuous silica cementation; few very fine and fine roots; common very fine tubular pores; few fine soft lime masses and few fine lime filaments; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (8 to 15 inches thick)

C'—45 to 60 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; common fine distinct strong brown (7.5YR 5/6) iron mottles, brown (7.5YR 4/4) moist; massive; hard, friable, slightly sticky and plastic; few fine and very fine roots; common very fine tubular pores; violently effervescent; strongly alkaline (pH 8.6).

These soils are usually dry; they are moist in winter and spring but are dry in June to early in November. The mean annual soil temperature is 50 to 52 degrees F. Where mixed, the particle-size control section averages 20 to 30 percent clay and has less than 15 percent sand that is fine or coarser. One or more of the subhorizons contain weak discontinuous silica cementation or 20 to 40 percent durinodes. Most profiles are mottled in the lower horizons, but the mottles are considered to be relict. The soil is strongly alkaline in the A horizon and is strongly alkaline or very strongly alkaline below this.

The A horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2, 3, or 4.

The C horizon has value of 4 or 5 when moist, and it has chroma of 3 or 4. It is dominantly silt loam or silty clay loam, but it is stratified fine sandy loam to silty clay in some pedons.

Beanflat Series

The Beanflat series consists of very deep, somewhat poorly drained, moderately permeable soils on alluvial flats. These soils formed in alluvium derived from mixed rock with some influence of loess. Slope is 0 to 2 percent. Elevation is 6,000 to 6,500 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 70 to l00 days.

Typical pedon of Beanflat silt loam, about 20 miles northwest of Eureka, about 1,260 feet east and 660 feet north of the southwest corner of sec. 10, T. 20 N., R. 50 E.

A—0 to 5 inches; very pale brown (10YR 7/3) silt loam, light yellowish brown (10YR 6/4) moist; moderate thick platy structure; slightly hard, friable, slightly sticky and slightly plastic; many fine vesicular pores; strongly effervescent; very strongly alkaline (pH 9.2); abrupt smooth boundary. (5 to 10 inches thick)

C1—5 to 16 inches; very pale brown (10YR 7/3) loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; common medium, fine, and very fine roots; common fine and very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (9 to 11 inches thick)

C2—16 to 22 inches; pale brown (10YR 6/3) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common medium, fine, and very fine roots; common fine and very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (6 to 14 inches thick)

C3—22 to 40 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; common coarse faint dark yellowish brown (10YR 4/4) mottles; massive; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; common fine and very fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (8 to 18 inches thick)

C4—40 to 44 inches; very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; massive; slightly hard, firm, sticky and slightly plastic; few fine and very fine roots; few very fine interstitial pores and few fine tubular pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 4 inches thick)

C5—44 to 60 inches; light brownish gray (2.5Y 6/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; many medium distinct mottles, dark yellowish brown (10YR 4/6) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; common fine and very fine interstitial pores; slightly effervescent; moderately alkaline (pH 8.0).

These soils are saturated within a depth of 40 inches at some time between December and May. The mean annual soil temperature is 45 to 47 degrees F. Where mixed, the particle-size control section is 10 to 18 percent clay. The A horizon is highly salt- and sodium-affected and is strongly alkaline or very strongly alkaline. There is a decrease in salt, sodium, and reaction with increasing depth.

The A horizon has value of 6 or 7 when dry and 4 to 6 when moist, and it has chroma of 3 or 4 when moist or when dry. It has platy or subangular blocky structure.

The C horizon has value of 5 to 7 when dry and 4 to 6 when moist, and it has chroma of 2 to 4 when moist or when dry. It is sandy loam, fine sandy loam, or loam. Some thin strata are as much as 25 percent rock fragments.

Boulder Lake Series

The Boulder Lake series consists of very deep, very poorly drained, very slowly permeable soils on flat lake plains. These soils formed in clayey lacustrine sediment. Slope is 0 to 2 percent. Elevation is about 7,200 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 60 to 80 days.

Typical pedon of a Boulder Lake silty clay, 0 to 2 percent slopes, in an area of Singletree Variant-Boulder Lake association, about 8 miles west-southwest of Eureka, about 1,000 feet east and 1,500 feet south of the northwest corner of sec. 3, T. 18 N., R. 52 E.

A—0 to 6 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; strong thick platy structure; hard, friable, sticky and plastic; common fine vesicular pores; neutral (pH 7.2); clear wavy boundary. (2 to 8 inches thick)

Bw1—6 to 10 inches; gray (10YR 6/1) clay, dark grayish brown (10YR 4/2) moist; strong coarse prismatic structure; very hard, very firm, very sticky and very plastic; few very fine roots; common fine tubular pores; mildly alkaline (pH 7.6); clear wavy boundary. (4 to 10 inches thick)

Bw2—10 to 28 inches; light brownish gray (2.5Y 6/2) clay, dark grayish brown (2.5Y 4/2) moist; common medium distinct brownish yellow (10YR 6/6) mottles, dark yellowish brown (10YR 4/6) moist; strong coarse prismatic structure; extremely hard, very firm, very sticky and very plastic; few medium, fine, and very fine roots; few fine tubular pores; common slickensides; moderately alkaline (pH 8.0); clear smooth boundary. (15 to 25 inches thick)

Bw3—28 to 60 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; common medium distinct brownish yellow (10YR 6/6) mottles, dark yellowish brown (10YR 4/6) moist; strong medium prismatic structure; hard, firm, sticky and plastic; few fine and very fine roots; few fine and very fine tubular pores; common slickensides; strongly effervescent; moderately alkaline (pH 8.4).

These soils are usually saturated for at least 1 month or more during most years, mainly during spring. The mean annual soil temperature ranges from 43 to 47 degrees F. The soils commonly are clay or silty clay. They commonly are noneffervescent but are effervescent in the lower part of the profile in some pedons. Reaction generally is slightly acid to mildly alkaline but is moderately alkaline in the lower part in some pedons.

The A horizon has hue of 10YR or 2.5Y, value of 5 or 6 when dry and 3 or 4 when moist, and chroma of 2 or 3. It has platy or granular structure.

The Bw horizon has hue of 10YR or 2.5Y, value of 5 or 6 when dry and 4 or 5 when moist, and chroma of 1 to 3. It has distinct or prominent mottles that have hue of 10YR to 5YR. It has prismatic or angular blocky structure.

Bregar Series

The Bregar series consists of shallow, well drained, moderately slowly permeable soils on crests and side slopes of hills and mountains. These soils formed in residuum derived from andesite, rhyolite, and quartzite. Slope is 15 to 75 percent. Elevation is 5,700 to 8,000 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Bregar very gravelly loam, 15 to 75 percent slopes, in an area of Bregar-Jivas-Duff association, about 16 miles south and 8 miles east of Crescent Valley, about 1,300 feet west and 2,630 feet north of the southeast corner of sec. 36, T. 27 N., R. 49 E.

A1—0 to 4 inches; pale brown (10YR 6/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; strong very fine and fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; 40 percent pebbles; neutral (pH 7.0); clear wavy boundary. (3 to 5 inches thick)

A2—4 to 6 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, sticky and plastic; few medium roots and common very fine and fine roots; many very fine tubular pores; 25 percent pebbles; neutral (pH 7.0); clear wavy boundary. (1 to 3 inches thick)

Bt—6 to 11 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; many very fine

tubular pores; many thin clay films lining pores and on ped faces; 55 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (4 to 6 inches thick)
R1—11 to 17 inches; highly fractured quartzite; less than 5 percent, by volume, soil-filled fractures.
R2—17 inches; quartzite.

These soils are usually dry; they are moist in winter and spring but are dry in June to October. Depth to bedrock ranges from 8 to 12 inches. Where mixed, the argillic horizon averages 25 to 35 percent clay. Reaction is neutral or mildly alkaline. In some pedons the upper few inches of bedrock is weathered or fractured.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. It has platy, subangular blocky, or granular structure.

The Bt horizon has value of 5 or 6 when dry and 3 or 4 when moist. It is mainly clay loam or sandy clay loam modified with 50 to 75 percent rock fragments, but some pedons are very gravelly loam or extremely gravelly loam.

Bregar Variant

The Bregar Variant consists of shallow, somewhat excessively drained, moderately slowly permeable soils on mountain crests and side slopes. These soils formed in residuum and colluvium derived from chert, shale, calcareous sandstone, and greenstone. Slope is 15 to 50 percent. Elevation is 6,400 to 7,100 feet. The mean annual precipitation is about 13 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Bregar Variant very cobbly loam, 15 to 50 percent slopes, in an area of Bregar Variant-Hymas-Quarz association, about 20 miles south and 3 miles east of Crescent Valley, about 250 feet west and 500 feet north of the southeast corner of sec. 10, T. 26 N., R. 48 E.

A1—0 to 2 inches; grayish brown (10YR 5/2) very cobbly loam, dark grayish brown (10YR 4/2) moist; strong very fine granular structure; soft, very friable, sticky and plastic; few very fine roots; many very fine interstitial and tubular pores; 15 percent pebbles and 35 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (1 to 4 inches thick)
A2—2 to 5 inches; brown (10YR 5/3) very gravelly clay loam, dark grayish brown (10YR 4/2) moist; strong very fine and fine granular structure; soft, very friable, sticky and plastic; many very fine and fine roots and few medium roots; many very fine interstitial and tubular pores; 55 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (0 to 4 inches thick)
Bt1—5 to 11 inches; very pale brown (10YR 7/3) extremely cobbly clay loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots and few medium and coarse roots; common very fine and few fine tubular pores; many thin clay films on ped faces and lining pores; 50 percent pebbles and 20 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (4 to 6 inches thick)
Bt2—11 to 14 inches; very pale brown (10YR 7/3) extremely cobbly clay loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; hard, friable, sticky and plastic; common very fine tubular pores; common thin clay films on ped faces and lining pores; lime coatings on the underside of cobbles; 40 percent pebbles and 40 percent cobbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (3 to 5 inches thick)
Btk—14 to 19 inches; very pale brown (10YR 7/3) extremely cobbly sandy clay loam, yellowish brown (10YR 5/4) moist; massive; hard, very friable, sticky and plastic; few very fine, fine, and medium roots; few very fine tubular pores; few thin clay films lining pores and bridging sand grains; lime coatings on the underside of cobbles; 40 percent pebbles and 40 percent cobbles; violently effervescent; strongly alkaline (pH 8.5); abrupt irregular boundary. (3 to 5 inches thick)
R—19 inches; consolidated calcareous sandstone.

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 44 to 46 degrees F. Depth to bedrock ranges from 12 to 20 inches. Where mixed, the argillic horizon averages 25 to 35 percent clay and 65 to 85 percent rock fragments. Reaction is moderately alkaline or strongly alkaline.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. It has granular or platy structure.

The B horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 3 or 4. Texture is extremely cobbly clay loam or extremely cobbly sandy clay loam.

The soils in the Bregar Variant differ from those of the Bregar series because they have bedrock at a depth of 12 to 20 inches, are moderately alkaline or strongly alkaline, and have lime throughout the profile.

Brinnum Series

The Brinnum series consists of very deep, very poorly drained, moderately slowly permeable soils on lake plains and basin floor remnants. These soils formed in silty alluvium over gravelly sandy alluvium. Slope is 0 to 2 percent. Elevation is 6,000 to 6,300 feet. The mean annual precipitation is about 8 inches, and the mean

annual temperature is about 46 degrees F. The frost-free season is 90 to 110 days.

Typical pedon of Brinnum silt loam, about 30 miles west of Eureka, in Bean Flat, about 1,500 feet east and 2,200 feet south of the northwest corner of sec. 33, T. 20 N., R. 49 E.

A1—0 to 3 inches; white (10YR 8/2) silt loam, light gray (10YR 7/2) moist; moderate very fine granular structure; soft, very friable, slightly sticky and slightly plastic; few medium roots and common fine and very fine roots; few medium, common fine, and many very fine tubular pores; strongly effervescent; very strongly alkaline (pH 9.6); abrupt smooth boundary. (2 to 4 inches thick)

A2—3 to 6 inches; white (10YR 8/2) silt loam, light gray (10YR 7/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium roots and common fine and very fine roots; few medium, common fine, and many very fine tubular pores; strongly effervescent; very strongly alkaline (pH 9.6); clear smooth boundary. (3 to 5 inches thick)

C1g—6 to 22 inches; white (10YR 8/2) silt loam, light gray (10YR 7/2) moist; common fine faint very pale brown (10YR 8/3 and 7/3, moist) mottles; weak medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, fine, and very fine roots; common fine and many very fine tubular pores; gray (N 5/0, moist) and dark gray (N 4/0, moist) silt coatings lining pores and root channels; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (14 to 18 inches thick)

C2g—22 to 41 inches; white (10YR 8/2) silty clay loam, light gray (10YR 7/2) moist; common fine faint very pale brown (10YR 8/3 and 7/3, moist) mottles; massive; slightly hard, friable, sticky and plastic; few medium, fine, and very fine roots; common fine and many very fine tubular pores; gray (N 5/0, moist) and dark gray (N 4/0, moist) silt coatings lining pores and root channels; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (9 to 25 inches thick)

2C—41 to 60 inches; light gray (2.5Y 7/2) gravelly loamy sand, light brownish gray (2.5Y 6/2) moist; single grain; loose; many fine and very fine interstitial pores; 25 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2).

These soils have a water table at a depth of 0.5 foot to 1.5 feet late in fall to early in summer. Some areas are partially drained and have a water table at a depth of 3 to 4 feet late in winter to early in spring. The mean annual soil temperature is 47 to 49 degrees F. The upper 19 to 36 inches is 15 to 40 percent exchangeable sodium, decreasing with increasing depth. Depth to the unconformable 2C horizon ranges from 40 to 60 inches or more. Reaction is moderately alkaline to very strongly alkaline, decreasing with increasing depth.

The A horizon has value of 7 to 8 when dry and 6 or 7 when moist.

The C horizon has value of 7 or 8 when dry and 6 or 7 when moist. Texture is stratified silt loam and silty clay loam with 18 to 35 percent clay.

The 2C horizon is stratified sandy loam, loamy sand, or sand modified with 15 to 35 percent fine pebbles.

Broyles Series

The Broyles series consists of very deep, well drained, moderately rapidly permeable soils on fan aprons and fan skirts. These soils formed in a thin loess cap overlying alluvium derived from various kinds of rock. Slope is 0 to 8 percent. Elevation is 4,700 to 6,400 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Broyles very fine sandy loam, 2 to 8 percent slopes, in an area of Broyles-Ricert association, about 6 miles east of Crescent Valley, about 1,050 feet north and 1,320 feet west of the southeast corner of sec. 5, T. 29 N., R. 49 E.

A1—0 to 3 inches; light brownish gray (2.5Y 6/2) very fine sandy loam, dark grayish brown (2.5Y 4/2) moist; moderate thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine vesicular pores and few very fine tubular pores; moderately alkaline (pH 8.4); abrupt wavy boundary. (3 to 7 inches thick)

A2—3 to 5 inches; light brownish gray (2.5Y 6/2) very fine sandy loam, brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine vesicular and interstitial pores and few very fine tubular pores; strongly alkaline (pH 8.6); abrupt wavy boundary. (0 to 3 inches thick)

Bw—5 to 11 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine tubular pores; strongly alkaline (pH 8.6); abrupt wavy boundary. (4 to 12 inches thick)

Bq—11 to 16 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; common very fine and fine roots; few very fine tubular pores; 50 to 60 percent weak discontinuous silica cementation; strongly alkaline (pH 8.8); abrupt wavy boundary. (4 to 8 inches thick)

Bqk—16 to 28 inches; light gray (10YR 7/2) very fine sandy loam, yellowish brown (10YR 5/4) moist;

massive; slightly hard, very friable, nonsticky and slightly plastic; common very fine and fine roots; many very fine tubular pores; 35 percent brittle durinodes 5 to 30 millimeters thick; few fine lime filaments or threads; few fine gypsum crystals; strongly effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (8 to 20 inches thick)

2Bk—28 to 60 inches; very pale brown (10YR 7/3) fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0).

These soils are usually dry; they are moist in winter and spring but are dry early in June to October. The mean annual soil temperature is about 50 to 52 degrees F. Depth to the Bq horizon is 10 to 17 inches. The particle-size control section is stratified loam to gravelly loamy sand. It has 5 to 15 percent clay and in some areas has as much as 25 percent pebbles. In some areas where slope is 2 percent or less, the profile is strongly salt- and sodium-affected throughout. The soils are normally slightly salt-affected or moderately salt-affected below a depth of 20 inches.

The A horizon has hue of 10YR or 2.5Y, value of 6 or 7 when dry and 4 or 5 when moist, and chroma of 2 or 3. It has platy structure or is massive. Reaction is moderately alkaline or strongly alkaline.

The Bw horizon has hue of 10YR or 2.5Y, value of 6 or 7 when dry and 4 or 5 when moist, and chroma of 2 or 3. It is massive or has subangular blocky or prismatic structure. Reaction is moderately alkaline or strongly alkaline.

The Bqk horizon has hue of 10YR or 2.5Y, value of 6 to 8 when dry and 4 to 6 when moist, and chroma of 1 to 4. Some subhorizons have 20 to 70 percent durinodes or 50 to 60 percent weak discontinuous silica cementation. The horizon is strongly alkaline or very strongly alkaline.

Bubus Series

The Bubus series consists of very deep, well drained, moderately permeable soils on basin floor remnants and stream terraces. These soils formed in alluvium derived from mixed rock sediments that are mainly of volcanic origin and are high in pyroclastic material. Slope is 0 to 8 percent. Elevation is 5,500 to 6,800 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 49 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Bubus very fine sandy loam, slightly saline-alkali, 2 to 8 percent slopes, in an area of Tulase-Bubus-McConnel association, about 22 miles south of Crescent Valley, about 1,000 feet north and 1,600 feet east of the southwest corner of sec. 32, T. 26 N., R. 48 E.

A—0 to 9 inches; light gray (10YR 7/2) very fine sandy loam, brown (10YR 5/3) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; few medium and fine roots; many coarse and medium vesicular pores; 5 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (5 to 10 inches thick)

C1—9 to 20 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common medium, fine, and very fine roots; common fine and very fine tubular pores; 5 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 11 inches thick)

Cqk1—20 to 29 inches; very pale brown (10YR 7/4) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; many fine and very fine roots; common fine and very fine tubular pores; 10 percent hard, firm, brittle durinodes; 5 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (7 to 14 inches thick)

Cqk2—29 to 49 inches; very pale brown (10YR 7/4) very fine sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine tubular pores; 25 percent hard, firm, brittle durinodes; 5 percent pebbles; violently effervescent; very strongly alkaline (pH 9.4); gradual smooth boundary. (15 to 22 inches thick)

2C—49 to 60 inches; light yellowish brown (10YR 6/4) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; few fine and very fine roots; many fine and very fine interstitial pores; 15 percent pebbles; moderately alkaline (pH 8.2).

These soils are usually dry; they are moist in winter and spring but are dry early in June to October. The mean annual soil temperature is 50 to 52 degrees F. Depth to the Cqk horizon ranges from 10 to 20 inches. Where mixed, the particle-size control section averages 10 to 15 percent clay that is more than 15 percent sand that is fine or coarser. The profile is strongly effervescent or violently effervescent. The A horizon is moderately alkaline or strongly alkaline, and the lower horizons are moderately alkaline to very strongly alkaline. The soils are normally strongly salt- and sodium-affected throughout the profile, but some pedons are only moderately affected or slightly affected in the upper horizons.

The A horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3. It is massive or has platy structure.

The C horizon has value of 6 or 7 when dry and 4 to 6 when moist, and it has chroma of 3 or 4. It is stratified sandy loam, fine sandy loam, very fine sandy loam, silt loam, or loam. Pedons that have lithologic discontinuities at some depth between 40 and 60 inches are stratified sand to gravelly loamy sand. The Cqk horizon has 20 to 50 percent weakly cemented to strongly cemented durinodes, and it commonly is as much as 5 percent pebbles.

Cavehill Series

The Cavehill series consists of moderately deep, well drained, moderately permeable soils on side slopes of mountains. These soils formed in residuum and colluvium derived from limestone and dolomite with some influence of loess. Slope is 15 to 50 percent. Elevation is 6,000 to 7,600 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 60 to 90 days.

Typical pedon of a Cavehill bouldery silt loam, 15 to 50 percent slopes, in an area of Hopeka-Cavehill association, about 33 miles south of Carlin, about 2,500 feet east and 300 feet south of the northwest corner of sec. 12, T. 27 N., R. 52 E.

The soil surface is partly covered with 5 percent boulders and 20 percent pebbles.

There is a 0.2- to 1-inch layer of needles and twigs on the surface.

A1—0 to 3 inches; grayish brown (10YR 5/2) bouldery silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; common fine roots and many very fine roots; common fine and very fine tubular and interstitial pores; 20 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 4 inches thick)

A2—3 to 9 inches; grayish brown (10YR 5/2) gravelly silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common medium roots and many very fine roots; common fine and very fine tubular pores; 20 percent pebbles and 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (5 to 13 inches thick)

A3—9 to 18 inches; grayish brown (10YR 5/2) very gravelly silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common medium and fine roots and many very fine roots; common fine and many very fine tubular pores; 35 percent pebbles and 15 percent cobbles; strongly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary. (0 to 12 inches thick)

Bk—18 to 29 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few medium roots and common fine and very fine roots; common fine and many very fine tubular pores; discontinuous weak lime cementation and moderately thick lime pendants on the undersides of rock fragments; 45 percent pebbles and 10 percent cobbles; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (6 to 11 inches thick)

R—29 inches; hard limestone.

These soils are usually moist, but they are dry from about mid-July to October. The mean annual soil temperature is 43 to 47 degrees F. The mollic epipedon ranges from 14 to 20 inches thick. The particle-size control section has 18 to 27 percent clay. It has 35 to 60 percent rock fragments, mainly pebbles and cobbles but stones are also common in some pedons. Texture is very gravelly silt loam, very gravelly loam, very cobbly loam, or very cobbly silt loam. Carbonates average 40 to 60 percent calcium carbonate equivalent; the upper part ranges from 15 to 50 percent, and the lower part ranges from 50 to 80 percent. Depth to the calcic horizon is 14 to 29 inches, and depth to bedrock is 20 to 40 inches. Reaction is moderately alkaline or strongly alkaline throughout.

The A horizon has value of 4 or 5 when dry. It has granular or subangular blocky structure. It is slightly effervescent after mixing to a depth of 7 inches in horizons at a depth of less than 10 inches and strongly effervescent or violently effervescent below a depth of 10 inches.

The AC horizon, where present, has value of 4 when moist, and it has chroma of 2 or 3.

The Bk horizon has value of 6 to 8 when dry and 4 to 7 when moist. It averages very gravelly loam but thin strata of gravelly loam are in some pedons. It has subangular blocky structure or is massive. It has weak discontinuous lime cementation and thin to thick lime pendants on the underside of rock fragments.

Chad Series

The Chad series consists of deep, well drained, slowly permeable soils on side slopes of mountains. These soils formed in residuum derived from chert and shale with small components of loess and volcanic ash. Slope is 15 to 50 percent. Elevation is 6,000 to 8,200 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 50 to 80 days.

Typical pedon of a Chad cobbly loam, 15 to 30 percent slopes, in an area of Chad-Cleavage-Softscrabble association, about 34 miles northwest of

Eureka, 1,500 feet north and 1,000 feet east of the southwest corner of sec. 24, T. 23 N., R. 49 E.

A1—0 to 4 inches; grayish brown (10YR 5/2) cobbly loam, dark brown (10YR 3/3) moist; moderate very fine granular structure; soft, very friable, nonsticky and slightly plastic; many fine and very fine roots; many fine and very fine interstitial pores; 10 percent pebbles and 10 percent cobbles; neutral (pH 7.2); clear smooth boundary. (4 to 6 inches thick)

A2—4 to 10 inches; dark brown (10YR 4/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium roots and common fine and very fine roots; many fine and very fine interstitial pores; 15 percent pebbles; neutral (pH 7.2); gradual smooth boundary. (5 to 7 inches thick)

BA—10 to 17 inches; yellowish brown (10YR 5/4) gravelly loam, brown (10YR 4/3) moist; moderate fine angular blocky structure; slightly hard, friable, slightly sticky and plastic; few medium and common fine roots; common fine and very fine tubular pores; few thin clay films in pores and on peds; 20 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (7 to 10 inches thick)

Bt1—17 to 28 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to moderate medium angular blocky; hard, firm, sticky and plastic; very few fine roots; common fine and very fine tubular pores; many thick pressure faces on peds; 20 percent pebbles; mildly alkaline (pH 7.6); clear wavy boundary. (ll to 16 inches thick)

Bt2—28 to 42 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium and fine angular blocky structure; very hard, very firm, sticky and plastic; common fine tubular pores; many thick pressure faces on peds; 30 percent pebbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (12 to 15 inches thick)

Cr—42 inches; shale.

These soils are dry late in June to October, but they are moist in winter and spring. The mean annual soil temperature is 43 to 45 degrees F. The mollic epipedon ranges from 10 to 15 inches thick, and in some pedons it includes the upper part of the argillic horizon. Where mixed, the upper 20 inches of the argillic horizon averages 35 to 45 percent clay with 10 to 30 percent fine pebbles. Depth to bedrock ranges from 40 to 60 inches.

The A horizon has value of 4 or 5 when dry, and it has chroma of 2 or 3.

The Bt horizon has value of 4 or 5 when dry and 3 or 4 when moist, and it has chroma of 3 or 4 in the upper part and 3, 4, or 6 in the lower part. It is clay loam or clay and commonly is gravelly. It has prismatic or angular blocky structure.

Some pedons have a C horizon above the bedrock.

Chen Series

The Chen series consists of shallow, well drained, very slowly permeable soils on mountain crests and side slopes. These soils formed in residuum derived from rhyolite, quartz latite, and quartz monzonite with some influence of loess that is high in content of volcanic ash. Slope is 15 to 50 percent. Elevation is 5,500 to 7,700 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Chen gravelly loam, 15 to 30 percent slopes, in an area of Chen-Ramires association, steep, about 4 miles south and 17 miles east of Crescent Valley, about 2,100 feet east and 1,500 feet north of the southwest corner of sec. 20, T. 29 N., R. 51 E.

The surface has a partial cover of 10 percent cobbles and 60 percent pebbles.

A1—0 to 3 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; slightly hard, very friable, sticky and plastic; many very fine roots; many very fine tubular pores; 10 percent cobbles and 20 percent pebbles; neutral (pH 7.2); clear wavy boundary. (3 to 6 inches thick)

A2—3 to 9 inches; brown (7.5YR 5/2) very gravelly loam, dark brown (7.5YR 3/2) moist; moderate fine and medium granular structure; slightly hard, very friable, sticky and plastic; many very fine and fine roots; few medium roots; many very fine tubular pores; 10 percent cobbles and 25 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (2 to 6 inches thick)

Bt1—9 to 11 inches; brown (10YR 5/2) very gravelly clay loam, dark brown (10YR 3/2) moist; moderate fine subangular blocky structure; hard, very friable, very sticky and very plastic; common very fine and fine roots; many very fine tubular pores; many thin clay films lining pores and on ped faces; 15 percent cobbles and 35 percent pebbles; neutral (pH 7.0); clear wavy boundary. (1 to 4 inches thick)

Bt2—11 to 17 inches; reddish brown (5YR 4/3) very cobbly clay, dark brown (5YR 3/4) moist; moderate fine and medium angular blocky structure; very hard, friable, very sticky and very plastic; few very fine and fine roots; many very fine tubular pores; continuous thick clay films lining pores and on ped faces; 35 percent cobbles and 20 percent pebbles; neutral (pH 7.3); abrupt irregular boundary. (4 to 7 inches thick)

R—17 inches; fractured rhyolite.

These soils are usually dry; they are moist in winter and spring but are dry in mid-June to October. The mean annual soil temperature is 45 to 47 degrees F. Thickness of the soil and depth to bedrock are 14 to 20 inches. The pebble and cobble content commonly increases with increasing depth. The mollic epipedon is 10 to 14 inches thick and includes the upper part of the argillic horizon. The particle-size control section has 40 to 55 percent clay and 45 to 65 percent pebbles and cobbles.

The A horizon has value of 5 or 6 when dry and 3 when moist, and it has chroma of 2 or 3. Where the upper 7 inches is mixed, value is less than 5.5 when dry. The horizon has 15 to 25 percent clay and has granular or platy structure.

The Bt1 horizon in most pedons is very gravelly clay loam with 35 to 40 percent clay.

The Bt horizon has hue of 10YR, 7.5YR, or 5YR, and it has value of 4 or 5 when dry and 3 or 4 when moist. It has subangular blocky or angular blocky structure.

Cherry Spring Series

The Cherry Spring series consists of moderately deep, well drained, moderately slowly permeable soils on fan piedmont remnants. These soils formed in loess over mixed alluvium. Slope is 2 to 8 percent. Elevation is 4,800 to 5,700 feet. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 47 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Cherry Spring loam, 2 to 8 percent slopes, in an area of Cherry Spring-Tomera association, about 2 miles south and 14 miles east of Crescent Valley, about 500 feet north and 900 feet east of the southwest corner of sec. 10, T. 29 N., R. 50 E.

A—0 to 5 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; moderate very thin and thin platy structure; slightly hard, very friable, sticky and plastic; common very fine roots; many very fine vesicular and tubular pores; 5 percent pebbles; mildly alkaline (pH 7.8); abrupt wavy boundary. (5 to 8 inches thick)

Bt1—5 to 9 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; weak medium and coarse prismatic structure; slightly hard, very friable, sticky and plastic; common very fine roots; many very fine and fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.0); clear wavy boundary. (4 to 7 inches thick)

Bt2—9 to 14 inches; light yellowish brown (10YR 6/4) clay loam, dark brown (7.5YR 4/4) moist; moderate fine and medium angular blocky structure; hard, very friable, sticky and very plastic; few very fine roots; many very fine tubular pores; common thin and moderately thick clay films lining pores and on ped faces; 5 percent pebbles; moderately alkaline (pH 8.0); abrupt wavy boundary. (5 to 8 inches thick)

Btqk—14 to 20 inches; light yellowish brown (10YR 6/4) loam, brown (7.5YR 4/4) moist; massive; hard, very friable, sticky and plastic; few very fine roots; common very fine tubular pores; 5 percent pebbles and 5 percent cobbles; common thin clay films lining pores; 15 percent durinodes 10 to 25 millimeters thick; few fine lime filaments; violently effervescent; strongly alkaline (pH 8.2); abrupt wavy boundary. (6 to 9 inches thick)

Bqkm—20 to 26 inches; light yellowish brown (10YR 6/4) alternately weakly cemented and strongly cemented duripan layers, dark brown (7.5YR 4/4) moist; thin (1 to 5 millimeters) discontinuous silica laminae; massive; very hard, very firm; common very fine tubular pores; many fine soft masses of lime; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (4 to 8 inches thick)

2Ck—26 to 54 inches; light brown (7.5YR 6/4) extremely gravelly sandy loam, dark brown (7.5YR 4/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; 70 percent pebbles and 10 percent cobbles; lime segregated in common fine filaments; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (20 to 30 inches thick)

3Cqk—54 to 63 inches; light brown (7.5YR 6/4) sandy loam, reddish brown (5YR 4/4) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; common very fine tubular pores; weak silica cementation with fragments of degraded, strongly cemented laminae cap; violently effervescent; strongly alkaline (pH 9.0).

These soils are usually dry; they are moist in winter and early in spring and are dry in June to October. The mean annual soil temperature is 48 to 51 degrees F. Depth to the duripan is 20 to 30 inches. The argillic horizon is loam, silt loam, or clay loam modified with 0 to 15 percent rock fragments. It is 20 to 35 percent clay.

The A horizon has value of 3 or 4 when moist. It has weak or moderate platy structure.

The Bt horizon has hue of 10YR or 7.5YR, and it has chroma of 3 or 4. It has weak or moderate, fine to coarse prismatic or subangular blocky structure or is massive.

The Bqkm horizon is strongly silica-cemented or has alternating layers of weak and strong silica cementation and in some pedons has very thin to thin discontinuous silica laminae. Reaction is strongly alkaline or very strongly alkaline.

The Cherry Spring soils in this survey area are taxadjunct to the Cherry Spring series because they have a 4- to 8-inch-thick strongly cemented duripan that extends to a depth of less than 40 inches. This difference, however, does not significantly affect use and management.

Cherry Spring Variant

The Cherry Spring Variant consists of well drained, moderately slowly permeable soils that are shallow to a duripan. These soils are on the middle and lower side slopes of low hills. They formed in alluvium derived from basalt, rhyolite, tuff, and siliceous bedrock. Slope is 8 to 15 percent. Elevation is 5,500 to 6,400 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 47 degrees F. The frost-free season is 90 to 120 days.

Typical pedon of a Cherry Spring Variant fine sandy loam, 8 to 15 percent slopes, in an area of Cherry Spring Variant-Tomera-Bregar association, about 18 miles south and 9 miles east of Crescent Valley, about 100 feet south and 900 feet east of the northwest corner of sec. 2, T. 26 N., R. 49 E.

A—0 to 4 inches; light brownish gray (10YR 6/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine tubular pores; 10 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (1 to 4 inches thick)

Bt—4 to 10 inches; pale brown (10YR 6/3) gravelly clay loam, dark brown (10YR 3/3) moist; moderate fine and medium angular blocky structure; slightly hard, very friable, sticky and plastic; many very fine and few fine roots; many very fine tubular pores; 25 percent pebbles; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 10 inches thick)

Bqk—10 to 18 inches; white (10YR 8/2) weakly cemented gravelly loam, very pale brown (10YR 7/3) moist; massive; hard, firm, brittle; common very fine and few fine roots; common very fine tubular pores; thin coatings of silica around pebbles; 30 percent pebbles; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (4 to 8 inches thick)

Bqkm—18 to 28 inches; white (10YR 8/2) indurated duripan, very pale brown (10YR 7/3) moist; massive; very hard, very firm; very thin silica laminae capping on upper part of horizon; 40 percent pebbles; violently effervescent; strongly alkaline (pH 8.6); abrupt irregular boundary. (6 to 10 inches thick)

Cqk—28 to 36 inches; white (10YR 8/2) very gravelly sandy loam, very pale brown (10YR 7/3) moist; massive; hard, firm, nonsticky and slightly plastic; few very fine roots; few very fine tubular pores; discontinuous strong lime and silica cementation; 45 percent pebbles; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (5 to 15 inches thick)

Cqkm—36 to 45 inches; very pale brown (10YR 8/3) strongly cemented duripan, very pale brown (10YR 7/3) moist; massive; very hard, very firm; few very fine tubular pores; silica laminae around and between pebbles; 45 percent pebbles and 5 percent cobbles; violently effervescent; strongly alkaline (pH 9.0).

These soils are usually dry in June to October, and they are moist in winter and spring. The mean annual soil temperature ranges from 47 to 50 degrees F. Depth to silica and lime is 10 to 14 inches. Depth to the duripan is 14 to 20 inches.

The A horizon has platy structure or is massive.

The Bt horizon is clay loam or loam. It is 15 to 35 percent rock fragments, dominantly pebbles. The horizon is 20 to 30 percent clay. It has subangular blocky or angular blocky structure.

The Bqkm horizon has value of 7 or 8 when dry and 6 or 7 when moist, and it has chroma of 2 or 3.

These soils are a variant of the Cherry Spring series because they are 14 to 20 inches deep to an indurated duripan.

Cleavage Series

The Cleavage series consists of shallow, well drained, moderately slowly permeable soils on mountain crests and side slopes. These soils formed in residuum derived from chert and shale. Slope is 8 to 15 percent. Elevation is 7,000 to 8,000 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 44 degrees. The frost-free season is 80 to 100 days.

Typical pedon of a Cleavage gravelly loam, 8 to 15 percent slopes, in an area of Chad-Cleavage-Softscrabble association, about 34 miles northwest of Eureka, about 1,200 feet east and 1,500 feet north of the southwest corner of sec. 24, T. 23 N., R. 49 E.

A—0 to 7 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and slightly plastic; many fine and very fine roots; many fine and very fine interstitial pores; 25 percent pebbles; neutral (pH 6.8); clear smooth boundary. (7 to 10 inches thick)

Bt1—7 to 11 inches; pale brown (10YR 6/3) very gravelly clay loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; many fine and very fine roots; many fine and very fine interstitial pores and common fine and very fine tubular pores; common moderately thick clay films on ped faces; 40 percent pebbles and 10 percent cobbles; neutral (pH 7.2); clear smooth boundary. (3 to 7 inches thick)

Bt2—11 to 14 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate fine angular blocky structure; slightly hard, friable, sticky and plastic; many fine

and very fine roots; many fine and very fine interstitial pores; 45 percent pebbles and 10 percent cobbles; neutral (pH 7.2); abrupt wavy boundary. (2 to 4 inches thick)

R—14 inches; fractured chert.

These soils are moist in winter and spring, but they are dry from July to October. The mean annual soil temperature is 44 to 46 degrees F. Depth to bedrock ranges from 14 to 20 inches. The mollic epipedon is 7 to 10 inches thick. The argillic horizon is sandy clay loam or clay loam; it is 20 to 35 percent clay and averages 50 to 70 percent rock fragments. These soils are neutral or mildly alkaline throughout the profile.

The A horizon has value of 4 or 5 when dry, and it has chroma of 2 or 3. It has granular or subangular blocky structure.

The Bt horizon has value of 5 or 6 when dry and 3 to 4 when moist, and it has chroma of 3 or 4. Structure is subangular blocky or angular blocky.

Clowfin Series

The Clowfin series consists of very deep, well drained, moderately rapidly permeable soils on fan skirts. These soils formed in alluvium derived from mixed volcanic and sedimentary rocks. Slope is 0 to 4 percent. Elevation is 5,000 to 6,400 feet. The mean annual precipitation is about 6 inches, and the mean annual temperature is about 47 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Clowfin sandy loam, 2 to 4 percent slopes, in an area of Wholan-Clowfin association, about 12 miles south of Eureka, about 2,200 feet east and 900 feet south of the northwest corner of sec. 17, T. 17 N., R. 54 E.

A—0 to 4 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; weak medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; common fine and very fine vesicular pores; 10 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (3 to 6 inches thick)

AC—4 to 14 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; few medium and fine roots; many fine and very fine interstitial pores; 25 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (8 to 12 inches thick)

C1—14 to 40 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; many fine and very fine interstitial pores; 50 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (20 to 36 inches thick)

C2—40 to 60 inches; very pale brown (10YR 7/3) extremely gravelly sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many fine and very fine interstitial pores; 70 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2).

These soils are usually dry; they are moist in winter and spring but are dry late in May to October. The mean annual soil temperature is about 47 to 53 degrees F. The particle-size control section is stratified and is dominantly fine sandy loam or sandy loam modified with an average of 35 to 50 percent pebbles. Some pedons contain strata of loamy fine sand, loamy sand, or loam. The soils are slightly effervescent to violently effervescent in the upper part and are strongly effervescent or violently effervescent in the lower part. Reaction is moderately alkaline or strongly alkaline throughout.

Coils Series

The Coils series consists of well drained, slowly permeable soils that are moderately deep to a duripan. These soils are on fan piedmont remnants. They formed in mixed alluvium derived from volcanic and sedimentary rocks. Slope is 2 to 15 percent. Elevation is 6,200 to 7,000 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Coils loam, 2 to 8 percent slopes, about 30 miles northwest of Eureka, about 50 feet west and 1,400 feet south of the northeast corner of sec. 35, T. 22 N., R. 48 E.

A1—0 to 3 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 5 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (3 to 6 inches thick)

A2—3 to 5 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure parting to moderate fine granular; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine interstitial pores; 5 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (0 to 5 inches thick)

Bt1—5 to 9 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine angular blocky structure; slightly hard, friable, sticky and plastic; common medium, fine, and very fine roots; common fine and very fine tubular pores; common thin and few moderately thick clay films on ped faces; 10 percent pebbles;

mildly alkaline (pH 7.4); clear wavy boundary. (4 to 8 inches thick)

Bt2—9 to 20 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 3/4) moist; moderate medium prismatic structure parting to strong medium angular blocky; hard, firm, very sticky and very plastic; few medium roots and common fine and very fine roots; few fine and very fine tubular pores; many thick pressure faces on ped faces; 10 percent pebbles; mildly alkaline (pH 7.6); clear wavy boundary. (10 to 15 inches thick)

Btk—20 to 26 inches; yellow (10YR 7/6) gravelly clay loam, yellowish brown (10YR 5/6) moist; moderate medium angular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots; common fine and very fine tubular pores; common thin and few moderately thick clay films in pores and on ped faces; 15 percent pebbles; slightly effervescent; mildly alkaline (pH 7.6); abrupt wavy boundary. (3 to 6 inches thick)

Bqkm—26 to 37 inches; very pale brown (10YR 8/3) strongly cemented very gravelly duripan, very pale brown (10YR 7/4) moist; massive; extremely hard, very firm; few fine and very fine roots in vertical and horizontal cracks; few very fine interstitial pores; violently effervescent; mildly alkaline (pH 7.8); gradual smooth boundary. (7 to 16 inches thick)

Bqk—37 to 60 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive with strongly cemented portions; hard, very firm, nonsticky and nonplastic; few fine and very fine roots; common fine and very fine interstitial pores; 35 percent pebbles; strongly effervescent; mildly alkaline (pH 7.8).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 45 to 47 degrees F. Depth to the strongly cemented duripan commonly is 22 to 30 inches, but it ranges from 20 to 40 inches in some pedons. The A and Bt horizons are neutral or mildly alkaline.

The A horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3.

The Bt horizon has hue of 7.5YR or 10YR, and it has value of 5 or 6 when dry and 3 to 5 when moist. It is clay loam, gravelly clay loam, clay, or gravelly clay. Rock fragment content ranges from 5 to 20 percent. Clay content averages 35 to 45 percent.

The Btk horizon has value of 6 or 7 when dry and 4 to 6 when moist, and it has chroma of 4 to 6. It is clay loam or gravelly clay loam. The clay content ranges from 30 to 40 percent. Rock fragment content ranges from 10 to 25 percent, mainly pebbles. The horizon is slightly effervescent or strongly effervescent.

The Bqk horizon is mildly alkaline or moderately alkaline.

Cortez Series

The Cortez series consists of well drained, very slowly permeable soils that are moderately deep to a duripan. These soils are on fan piedmont remnants. They formed in thin loess deposits over alluvium derived from various kinds of rock. Slope is 4 to 15 percent. Elevation is 5,400 to 6,200 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 46 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Cortez silt loam, 4 to 15 percent slopes, in an area of Cortez-Tenvorrd association, about 39 miles south of Carlin, about 1,050 feet east and 1,320 feet south of the northwest corner of sec. 5, T. 26 N., R. 52 E.

A—0 to 6 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; moderate very thin platy structure; slightly hard, friable, sticky and plastic; common very fine roots; common very fine vesicular and tubular pores; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 6 inches thick)

A2—6 to 11 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, friable, sticky and plastic; common fine and very fine roots; many very fine tubular pores; moderately alkaline (pH 8.0); abrupt wavy boundary. (2 to 8 inches thick)

2Bt—11 to 18 inches; pale brown (10YR 6/3) clay, brown (10YR 4/3) moist; strong medium prismatic structure parting to moderate medium angular blocky; hard, friable, very sticky and very plastic; common very fine roots; common very fine tubular pores; moderately alkaline (pH 8.4); clear wavy boundary. (4 to 8 inches thick)

2Btnk—18 to 24 inches; light yellowish brown (10YR 6/4) clay, brown (7.5YR 4/4) moist; moderate medium angular blocky structure; hard, friable, very sticky and very plastic; few very fine roots; common very fine tubular pores; common fine seams of lime; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (4 to 7 inches thick)

2Bqkm—24 to 42 inches; very pale brown (10YR 8/3) indurated duripan, light yellowish brown (10YR 6/4) moist; massive; hard, firm; few very fine roots; few very fine tubular pores; violently effervescent; strongly alkaline (pH 8.6).

These soils are usually dry; they are moist in spring but are dry in June to October. The mean annual soil temperature is 47 to 49 degrees F. Depth to the indurated duripan ranges from 22 to 29 inches. The lower part of the Btn horizon has common to many, very fine to medium lime filaments and seams. An abrupt textural boundary is at the top of the 2Bt horizon; the clay content increases to more than 15 percent.

The A horizon has value of 5 to 7 when dry and 3 or 4 when moist, and it has chroma of 2 or 3.

The 2Bt and 2Btnk horizon has hue of 10YR or 7.5YR, value of 5 or 6 when dry and 3 to 5 when moist, and chroma of 2 to 4.

The Bqkm horizon has value of 6 to 8 when dry and 4 to 7 when moist, and it has chroma of 2 to 4. Reaction is strongly alkaline to very strongly alkaline.

Creemon Series

The Creemon series consists of very deep, well drained, moderately permeable soils on fan skirts. These soils formed in alluvium derived from various kinds of rock with an influence of loess and volcanic ash. Slope is 0 to 4 percent. Elevation is 4,600 to 5,000 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Creemon silt loam, 0 to 2 percent slopes, in an area of Whirlo-Creemon association, about 500 feet north and 500 feet west of the southeast corner of sec. 15, T. 30 N., R. 48 E.

A—0 to 5 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine vesicular pores and many very fine tubular pores; strongly alkaline (pH 8.6); abrupt wavy boundary. (3 to 7 inches thick)

Bw—5 to 11 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine tubular pores; moderately alkaline (pH 8.4); abrupt wavy boundary. (5 to 8 inches thick).

Bqk1—11 to 15 inches; very pale brown (10YR 7/3) silt loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine tubular pores; 50 percent weak discontinuous silica cementation; strongly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (4 to 6 inches thick)

Bqk2—15 to 19 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; few very fine tubular pores; 30 percent weak durinodes; strongly effervescent; common fine lime filaments; strongly alkaline (pH 9.0); clear wavy boundary. (4 to 6 inches thick)

Bqk3—19 to 34 inches; pale brown (10YR 6/3) silt loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; 40 percent weak durinodes; many fine lime filaments; strongly effervescent; moderately alkaline (pH 8.2); gradual smooth boundary. (13 to 18 inches thick)

C—34 to 45 inches; pale brown (10YR 4/3) silt loam, dark brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; few very fine roots; common very fine tubular pores; strongly effervescent; few fine segregated lime filaments; moderately alkaline (pH 8.4); clear smooth boundary. (8 to 15 inches thick)

Cq—45 to 60 inches; light yellowish brown (10YR 6/4) very fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; very few very fine roots; common very fine tubular pores; 50 percent weak durinodes 5 to 25 millimeters in diameter; many fine gypsum filaments; strongly effervescent; moderately alkaline (pH 8.4).

These soils are usually dry; they are moist in winter and spring but are dry late in May to October. The mean annual soil temperature ranges from 50 to 52 degrees F. Reaction is moderately alkaline or strongly alkaline throughout the profile. Depth to the Bqk horizon is 11 to 15 inches.

The A horizon has value of 6 or 7 when dry and 3 or 4 when moist, and it has chroma of 2 or 3.

The Bw horizon has value of 6 or 7 when dry, and it has chroma of 2 or 3. It is massive or has very thin platy structure. Texture is silt loam or very fine sandy loam.

The Bqk horizon has value of 6 or 7 when dry, and it has chroma of 3 or 4. It is dominantly silt loam, but it has strata of very fine sandy loam in the lower part in some pedons. It has 40 to 60 percent weak discontinuous silica cementation or 30 to 40 percent durinodes 5 to 25 millimeters in diameter.

Davey Series

The Davey series consists of very deep, somewhat excessively drained, moderately rapidly permeable soils on fan skirts. These soils formed in alluvium derived from various kinds of rock. Slope is 0 to 4 percent. Elevation is 4,700 to 5,500 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 49 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Davey sandy loam, 0 to 4 percent slopes, in an area of Enko-Davey-McConnel association, about 8 miles south and 4 miles east of Crescent Valley, about 45 feet south and 45 feet west of the northeast corner of sec. 18, T. 28 N., R. 49 E.

A1—0 to 2 inches; brown (10YR 5/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak very thin platy structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very

fine vesicular and tubular pores; 10 percent pebbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (2 to 4 inches thick)

A2—2 to 6 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; moderate very thin and thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine vesicular and tubular pores; mildly alkaline (pH 7.8); abrupt wavy boundary. (3 to 5 inches thick)

Bw1—6 to 11 inches; yellowish brown (10YR 5/4) loam, dark brown (10YR 3/3) moist; weak medium prismatic structure; hard, very friable, sticky and plastic; common very fine and fine roots; many very fine tubular pores; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 6 inches thick)

Bw2—11 to 18 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; 25 percent pebbles; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 8 inches thick)

Bk—18 to 33 inches; very pale brown (10YR 7/3) loamy sand, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine and very fine roots; common very fine tubular pores; lenses of ash 0.5 to 6 inches thick; strongly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (10 to 20 inches thick)

2Ck—33 to 49 inches; variegated gravelly sand; single grain; loose, nonsticky and nonplastic; many very fine and fine roots in pockets; 25 percent pebbles and 5 percent cobbles; lime coatings on the underside of pebbles; areas of slight, strong, and violent effervescence in matrix; strongly alkaline (pH 8.6); abrupt wavy boundary. (10 to 20 inches thick)

3Ck—49 to 60 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; strongly effervescent; common fine lime filaments; strongly alkaline (pH 8.8).

These soils are usually dry; they are moist in winter and spring but are dry in May to October. The mean annual soil temperature is about 50 to 52 degrees F. Depth to lime is 15 to 24 inches. The particle-size control section is somewhat stratified, and it commonly grades to coarser textured material with increasing depth. The average texture is dominantly loamy sand, but some pedons have thin layers of sandy loam. Some pedons have as much as 30 percent rock fragments in any one horizon, but the content of rock fragments in the control section averages less than 15 percent. The upper part of the profile is neutral to moderately alkaline, and the lower part is moderately alkaline or strongly alkaline.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3.

The Bw horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 3 or 4. It has prismatic structure or is massive.

Decram Series

The Decram series consists of moderately deep, well drained, moderately permeable soils on mountain crests, shoulders, and upper side slopes. These soils formed in residuum derived from quartzite, andesite chert, and volcanic rock. Slope is 8 to 50 percent. Elevation is 7,500 to 9,500 feet. The mean annual precipitation is about 18 inches, and the mean annual temperature is about 42 degrees F. The frost-free season is less than 50 days.

Typical pedon of a Decram very gravelly loam, 15 to 50 percent slopes, in an area of Decram-Decram Variant-Duff association, about 2 miles east and 24 miles south of Carlin, about 15 feet south of trail west of Modarelli Mine; about 1,600 feet east and 500 feet south of the northwest corner of sec. 25, T. 29 N. R. 50 E.

A1—0 to 3 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; strong very fine and fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; 40 percent pebbles; neutral (pH 6.8); abrupt wavy boundary. (3 to 8 inches thick)

A2—3 to 10 inches; brown (10YR 5/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; 45 percent pebbles; neutral (pH 7.2); clear wavy boundary. (4 to 8 inches thick)

Bw—10 to 14 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium angular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; 45 percent pebbles; neutral (pH 7.2); clear wavy boundary. (4 to 8 inches thick)

C—14 to 39 inches; light brown (7.5YR 6/4) extremely gravelly loam, brown (7.5YR 4/4) moist; massive; soft, very friable, slightly sticky and plastic, many very fine and fine roots; roots are concentrated in areas along surfaces of cobbles and larger pebbles; common very fine tubular pores; 60 percent pebbles and 25 percent cobbles; mildly alkaline (pH 7.6); abrupt irregular boundary. (15 to 25 inches thick)

R—39 inches; fractured, consolidated andesite.

These soils are usually dry; they are moist in winter and spring but are dry in summer and early in fall. The mean annual soil temperature is 43 to 45 degrees F. Depth to bedrock is 30 to 40 inches. Reaction is neutral or mildly alkaline in the A and Bw horizons and is mildly alkaline or moderately alkaline in the C horizon. Thickness of the mollic epipedon ranges from 10 to 15 inches.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3.

The Bw horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 3 or 4. Texture is very gravelly loam or very cobbly loam.

The C horizon has hue of 10YR or 7.5YR, value of 5 or 6 when dry and 3 or 4 when moist, and chroma of 3 or 4.

Decram Variant

The Decram Variant consists of moderately deep, well drained, moderately slowly permeable soils on mountain crests and side slopes. These soils formed in residuum derived from andesite, quartz latite, and rhyolite. Slope is 15 to 30 percent. Elevation is 7,500 to 8,300 feet. The mean annual precipitation is about 16 inches, and the mean annual temperature is about 42 degrees F. The frost-free season is 60 to 80 days.

Typical pedon of a Decram Variant very cobbly loam, 15 to 30 percent slopes, in an area of Decram-Decram Variant-Duff association, about 2 miles west and 24 miles south of Carlin, about 2,100 feet east and 700 feet south of the northwest corner of sec. 25, T. 29 N., R. 50 E.

A1—0 to 5 inches; grayish brown (10YR 5/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; few very fine tubular pores; 40 percent pebbles and 25 percent cobbles; neutral (pH 7.2); clear wavy boundary. (4 to 7 inches thick)

A2—5 to 14 inches; brown (10YR 5/3) very gravelly silt loam, dark brown (10YR 3/3) moist; weak very fine, fine, and medium subangular blocky structure; soft, very friable, sticky and plastic; many very fine roots; few very fine tubular pores; 45 percent pebbles and 5 percent cobbles; neutral (pH 7.2); clear wavy boundary. (5 to 9 inches thick)

Bt1—14 to 22 inches; light yellowish brown (10YR 6/4) extremely gravelly clay loam, dark yellowish brown (10YR 4/4) moist; weak very fine and fine subangular blocky structure; slightly hard, very friable, very sticky and plastic; common very fine and fine roots; common very fine tubular pores; common thin clay films lining pores and on ped faces; 60 percent pebbles and 5 percent cobbles; neutral (pH 7.2); clear wavy boundary. (6 to 10 inches thick)

Bt2—22 to 26 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, sticky and plastic; few very fine roots; few very fine tubular pores; few thin clay films bridging sand grains; 60 percent pebbles and 15 percent cobbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (3 to 7 inches thick)

R—26 inches; fractured, andesite.

These soils are usually dry; they are moist in winter and spring but are dry in mid-July to October. The mean annual soil temperature is 44 to 47 degrees F. Depth to bedrock is 20 to 32 inches. The mollic epipedon is 9 to 15 inches thick. The particle-size control section has 30 to 35 percent clay and more than 60 percent rock fragments.

The A horizon has chroma of 2 or 3.

The Bt horizon is extremely gravelly sandy clay loam or extremely gravelly clay loam.

These soils are a variant of the Decram series because they have an argillic horizon.

Dianev Series

The Dianev series consists of very deep, somewhat poorly drained, slowly permeable soils on flood plains. These soils formed in mixed alluvium. Slope is 0 to 2 percent. Elevation is 6,000 to 7,000 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 50 to 80 days.

Typical pedon of Dianev silt loam, occasionally flooded, about 20 miles northwest Eureka, about 1,900 feet north and 700 feet west of the southeast corner of sec. 10, T. 20 N., R. 50 E.

A—0 to 5 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak medium platy structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and nonplastic; common fine and very fine roots; many fine and very fine vesicular pores and common fine and very fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (3 to 7 inches thick)

C1—5 to 12 inches; very pale brown (10YR 8/3) silty clay loam, pale brown (10YR 6/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common fine and very fine roots; common fine and very fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (5 to 10 inches thick)

C2—12 to 35 inches; very pale brown (10YR 8/3) silty clay loam, pale brown (10YR 6/3) moist; massive; hard, friable, sticky and plastic; common fine and very fine roots; common fine and very fine tubular

pores; strongly effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (18 to 25 inches thick)

C3—35 to 57 inches; white (10YR 8/1) silt loam, light brownish gray (10YR 6/2) moist; common medium distinct brownish yellow (10YR 6/6) mottles, dark yellowish brown (10YR 4/6) moist; massive; hard, friable, slightly sticky and plastic; few fine roots; common fine and very fine tubular pores; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (22 to 25 inches thick)

2C—57 to 60 inches; light brownish gray (2.5Y 6/2) loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; common fine and very fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.0).

These soils are dry late in July to October in most years. They have a seasonally high water table at a depth of 2.5 to 4.0 feet. The mean annual soil temperature is 44 to 47 degrees F. The particle-size control section averages 20 to 35 percent clay. Exchangeable sodium content is 25 to 40 percent at a depth of 10 to 30 inches, and it decreases below these depths.

The A horizon has hue of 10YR to 5Y, value of 5 to 7 when dry and 3 to 6 when moist, and chroma of 1 to 3. This horizon is strongly alkaline or very strongly alkaline and is strongly effervescent or violently effervescent.

The C horizon has hue of 10YR to 5Y, value of 6 to 8 when dry and 3 to 6 when moist, and chroma of 1 to 3. It is dominantly silt loam or silty clay loam stratified with loamy sand to clay below a depth of 40 inches. The horizon is moderately alkaline or strongly alkaline and is strongly effervescent or violently effervescent. The part of the C horizon below a depth of 30 inches commonly is mottled or gleyed. Stratified lakebed sediment that is loamy sand to clay is at a depth of more than 40 inches.

Donna Series

The Donna series consists of well drained, very slowly permeable soils that are moderately deep to a duripan. These soils are on fan piedmonts. They formed in alluvium derived from various kinds of rock. Slope is 2 to 8 percent. Elevation is 5,600 to 6,500 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Donna gravelly loam, 2 to 8 percent slopes, in an area of Donna-Stampede association, about 4 miles south and 18 miles east of Crescent Valley, about 2,300 feet east and 2,600 feet south of the northwest corner of sec. 29, T. 29 N., R. 51 E.

A1—0 to 2 inches; light brownish gray (10YR 6/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate thin and medium platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine vesicular pores; 15 percent pebbles; neutral (pH 6.8); abrupt smooth boundary. (1 to 3 inches thick)

A2—2 to 6 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; strong very thin and thin platy structure; slightly hard, very friable, sticky and plastic; many very fine and fine roots and few medium roots; many very fine vesicular and interstitial pores; 20 percent pebbles; neutral (pH 6.8); clear wavy boundary. (1 to 4 inches thick)

A3—6 to 10 inches; grayish brown (10YR 5/2) gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and fine roots and few medium roots; many very fine tubular pores; few uncoated sand grains; 20 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (3 to 5 inches thick)

Bt—10 to 19 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 4/4) moist; grayish brown (10YR 5/2) organic stains in the upper 0.25 to I.0 inch, very dark grayish brown (10YR 3/2) moist; strong medium prismatic structure parting to strong medium and coarse angular blocky; very hard, firm, very sticky and very plastic; few very fine and fine roots; many very fine tubular pores; continuous thick pressure faces; few slickensides; 5 percent pebbles; neutral (pH 7.4); abrupt wavy boundary. (7 to 12 inches thick)

Btk1—19 to 25 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 4/4) moist; moderate medium prismatic structure parting to strong medium and coarse angular blocky; very hard, friable, very sticky and very plastic; few very fine roots; few very fine tubular pores; continuous thick pressure faces; few slickensides; common fine soft lime masses; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (4 to 8 inches thick)

Btk2—25 to 29 inches; light brown (7.5YR 6/4) clay, dark brown (7.5YR 4/4) moist; few fine distinct yellowish red (5YR 5/6) mottles, yellowish red (5YR 4/6) moist; weak medium prismatic structure parting to moderate medium angular blocky; hard, friable, very sticky and very plastic; few very fine roots; few very fine tubular pores; many moderately thick clay films lining pores and on ped faces; common fine lime filaments; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (3 to 5 inches thick)

Bqkm—29 to 35 inches; white (10YR 8/2) indurated duripan with very thin (1 to 2 millimeters) continuous silica and lime laminae; upper 1 to 2 inches is fractured; massive; extremely hard, extremely firm;

many very fine roots along fracture planes; few very fine tubular pores below laminae; many fine lime filaments on laminae; strongly effervescent; moderately alkaline (pH 8.4).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is about 45 to 47 degrees F. The mollic epipedon is 7 to 12 inches thick. Depth to the duripan is 20 to 32 inches. Reaction is neutral to moderately alkaline, increasing with increasing depth.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, but only the upper 1 to 3 inches has value of 6 when dry and 4 when moist. The horizon has chroma of 2 or 3. This horizon commonly has weak to strong, very thin to medium platy structure.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6 when dry and 4 or 5 when moist, and chroma of 3 or 4. It averages 60 to 70 percent clay. It has weak to strong medium prismatic structure parting to strong or moderate, medium or coarse angular blocky. Rock fragment content is as much as 5 percent, mostly pebbles.

The Donna soils in this survey area are taxadjunct to the Donna series because of the presence of carbonates in the lower part of the argillic horizon and because the argillic horizon is mildly alkaline or moderately alkaline. These differences, however, do not significantly affect use and management.

Duff Series

The Duff series consists of deep, well drained, moderately permeable soils on concave side slopes of mountains. These soils formed in residuum and colluvium derived from intrusive and extrusive volcanic rock. Slope is 15 to 75 percent. Elevation is 6,200 to 8,300 feet. The mean annual precipitation is about 16 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 60 to 80 days.

Typical pedon of a Duff gravelly loam, 30 to 75 percent slopes, in an area of Bregar-Jivas-Duff association, about 11 miles east and 12 miles south of Crescent Valley, about 500 feet south and 1,500 feet west of the northeast corner of sec. 36, T. 28 N., R. 49 E.

A1—0 to 7 inches; grayish brown (10YR 5/2) gravelly loam, very dark gray (10YR 3/1) moist; moderate fine and medium granular structure; slightly hard, very friable, sticky and plastic; many very fine and fine roots; many very fine and few fine tubular pores; 20 percent pebbles; neutral (pH 6.8); abrupt wavy boundary. (4 to 10 inches thick)

A2—7 to 14 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; hard, very friable, sticky and plastic; common very fine and fine roots; many very fine and few fine tubular pores; 25 percent pebbles; neutral (pH 6.8); clear wavy boundary. (5 to 12 inches thick)

A3—14 to 21 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; hard, very friable, sticky and plastic; common very fine and few fine roots; many very fine and few fine and medium tubular pores; 20 percent pebbles; neutral (pH 6.8); clear wavy boundary. (4 to 13 inches thick)

A4—21 to 27 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; hard, very friable, sticky and plastic; few very fine and fine roots; many very fine tubular and few fine and medium tubular pores; 20 percent pebbles; neutral (pH 6.6); clear wavy boundary. (0 to 8 inches thick)

AC—27 to 37 inches; pale brown (10YR 6/3) gravelly loam, very dark grayish brown (10YR 3/2) and dark brown (10YR 4/3) moist; massive; slightly hard, very friable, sticky and plastic; few very fine and fine roots; many very fine and few fine and medium tubular pores; 20 percent pebbles and 5 percent cobbles; neutral (pH 7.2); clear wavy boundary. (0 to 10 inches thick)

C—37 to 57 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, sticky and plastic; few very fine roots; many very fine tubular pores; 20 percent pebbles; neutral (pH 7.2); abrupt irregular boundary. (18 to 22 inches thick)

R—57 inches; andesite.

These soils are moist late in fall to early in summer and are dry late in July to September. The mean annual soil temperature is 43 to 47 degrees F. The average summer soil temperature is 54 to 59 degrees. Depth to bedrock ranges from 40 to 60 inches. The mollic epipedon is 16 to 35 inches thick. The particle-size control section is typically loam and clay loam; it is 18 to 30 percent clay modified with 15 to 35 percent rock fragments, mainly pebbles and a few cobbles or stones. Reaction ranges from slightly acid to mildly alkaline.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3 when dry and 1 or 2 when moist. Structure is platy, granular, or subangular blocky.

The C horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 3 or 4.

Ebic Series

The Ebic series consists of moderately deep, well drained, very slowly permeable soils on mountain crests and side slopes. These soils formed in residuum derived from andesitic tuff and quartz latite. Slope is 15 to 50

percent. Elevation is 6,500 to 8,100 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 42 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Ebic very stony clay loam, 30 to 50 percent slopes, in an area of Ebic-Ziram-Jivas association, steep, about 4 miles east and 17 miles south of Crescent Valley, about 1,050 feet north and 260 feet east of the southwest corner of sec. 31, T. 27 N., R. 49 E.

A1—0 to 4 inches; grayish brown (10YR 5/2) very stony clay loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine granular structure; soft, very friable, sticky and plastic; many very fine roots; many very fine irregular pores; 10 percent stones, 10 percent cobbles, and 25 percent pebbles; neutral (pH 6.8); clear wavy boundary. (3 to 6 inches thick)

A2—4 to 9 inches; brown (10YR 5/3) very stony clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and few fine roots; common very fine irregular and tubular pores; 10 percent stones, 15 percent cobbles, and 25 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (4 to 6 inches thick)

Bt1—9 to 14 inches; yellowish brown (10YR 5/4) extremely cobbly clay, dark yellowish brown (10YR 4/4) moist; strong moderate and coarse angular blocky structure; hard, friable, sticky and very plastic; few very fine, fine, and medium roots; few very fine tubular pores; continuous thick clay films on ped faces and lining pores; 25 percent cobbles and 40 percent pebbles; neutral (pH 7.2); clear wavy boundary. (4 to 8 inches thick)

Bt2—14 to 23 inches; brownish yellow (10YR 6/6) extremely cobbly clay, dark yellowish brown (10YR 4/6) moist; moderate fine and medium angular blocky structure; hard, friable, very sticky and very plastic; few very fine, fine, and medium roots; common very fine tubular pores; many moderately thick clay films on ped faces and lining pores; 25 percent cobbles and 45 percent pebbles; mildly alkaline (pH 7.4); abrupt irregular boundary. (6 to 11 inches thick)

R—23 inches; fractured tuff and quartz latite; few very fine roots along fractures.

These soils are moist in winter and early in summer, and they are dry in mid-July to October. The mean annual soil temperature is 43 to 46 degrees F. Depth to bedrock is 20 to 30 inches. Reaction is neutral or mildly alkaline.

The Bt horizon is very cobbly clay or extremely cobbly clay; it is 50 to 60 percent clay in the upper part and 40 to 50 percent in the lower part.

Eightmile Series

The Eightmile series consists of shallow, well drained, moderately permeable soils on side slopes of mountains. These soils formed in residuum derived shale, sandstone, and quartzite. Slope is 15 to 75 percent. Elevation is 6,400 to 8,000 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 50 to 80 days.

Typical pedon of an Eightmile very gravelly loam, 15 to 30 percent slopes, in an area of Mau-Shagnasty-Eightmile association, about 25 miles south of Eureka, about 1,200 feet north of the southwest corner of sec. 10, T. 15 N., R. 52 E.

A—0 to 3 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, friable, nonsticky and slightly plastic; few fine and very fine roots; common fine and very fine vesicular pores; 35 percent pebbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (3 to 7 inches thick)

C—3 to 9 inches; yellowish brown (10YR 5/4) extremely gravelly loam, brown (10YR 4/3) moist; massive; soft, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine interstitial pores; 70 percent pebbles; mildly alkaline (pH 7.8); gradual smooth boundary. (3 to 11 inches thick)

Cr—9 to 24 inches; yellowish brown (10YR 5/4) highly fractured shale, brown (10YR 4/3) moist; few fine roots along cracks; clear wavy boundary. (10 to 22 inches thick)

R—24 inches; shale.

These soils are usually dry; they are moist in winter and spring but are dry late in June to October. The mean annual soil temperature is 44 to 46 degrees F. Depth to paralithic contact ranges from 6 to 14 inches. The profile averages 35 to 70 percent angular pebbles and cobbles.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist.

The C horizon has chroma of 3 or 4. It is very gravelly loam, very cobbly loam, or extremely gravelly loam.

Enko Series

The Enko series consists of very deep, well drained, slowly permeable soils on inset fans and fan skirts. These soils formed in alluvium derived from various kinds of rock. Slope is 0 to 15 percent. Elevation is 4,700 to 5,800 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 49 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of an Enko loam, 2 to 4 percent slopes, in an area of Enko-Davey-McConnel association, about 4 miles east and 7 miles south of Crescent Valley, about 30 feet east of road, about 2,110 feet north and 1,580 feet west of the southeast corner of sec. 12, T. 28 N., R. 48 E.

A1—0 to 2 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak very thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 5 inches thick)

A2—2 to 6 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; weak very thin and thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine vesicular pores; moderately alkaline (pH 8.4); abrupt wavy boundary. (4 to 6 inches thick)

Bw—6 to 15 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; massive; hard, very friable, sticky and plastic; many very fine, fine, and medium roots; many very fine tubular pores; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 20 inches thick)

Bqk1—15 to 20 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; massive; hard, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots and few coarse roots; common very fine and fine tubular pores; few fine lime filaments; 25 percent weak and moderately strong durinodes; strongly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (5 to 8 inches thick)

Bqk2—20 to 36 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; massive; hard, firm, brittle; few very fine roots; many very fine and few fine tubular pores; common fine lime filaments; continuous weak silica cementation; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (10 to 20 inches thick)

Bqk3—36 to 49 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine tubular pores; common fine lime filaments; 25 percent weak and moderately strong durinodes; strongly effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (10 to 13 inches thick)

Bky—49 to 63 inches; very pale brown (10YR 7/3) sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; many very fine and few fine tubular pores; common fine lime filaments; common fine gypsum crystals; violently effervescent; moderately alkaline (pH 8.4).

These soils are usually dry; they are moist in winter and spring and dry in June to October. The mean annual soil temperature is 50 to 52 degrees F. Combined thickness of the A and Bw horizons is 12 to 18 inches. Depth to weak silica cementation is 16 to 25 inches.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3.

The Bw horizon has chroma of 2 or 3 when dry. It is loam, sandy loam, or fine sandy loam.

The Bqk horizon value of 5 or 6 when moist, and it has chroma of 3 or 4. It is loam, sandy loam, or fine sandy loam.

Fenster Series

The Fenster series consists of very deep, well drained, moderately permeable soils on inset fans and flood plains. These soils formed in silty alluvium derived from highly calcareous material and loess. Slope is 0 to 2 percent. Elevation is 6,000 to 6,800 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of Fenster silt loam, about 22 miles southwest of Eureka, about 2,100 feet west and 500 feet north of the southeast corner of sec. 28, T. 17 N., R. 51 E.

A1—0 to 2 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; moderate medium and thin platy structure; soft, friable, nonsticky and nonplastic; common fine roots; many fine vesicular pores; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 4 inches thick)

A2—2 to 6 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; moderate thin platy structure parting to moderate fine granular; soft, friable, sticky and slightly plastic; many fine roots; common fine interstitial pores; strongly effervescent; very strongly alkaline (pH 9.6); clear smooth boundary. (0 to 4 inches thick)

C1—6 to 13 inches; light brownish gray (10YR 6/2) silt loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; soft, friable, sticky and slightly plastic; common medium and fine roots; common fine interstitial and tubular pores; violently effervescent; very strongly alkaline (pH 9.4); gradual smooth boundary. (7 to 10 inches thick)

C2—13 to 20 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; massive; soft, friable, sticky and slightly plastic; common medium and fine roots; common fine and very fine interstitial and tubular pores; violently effervescent; very strongly alkaline (pH 9.4); gradual smooth boundary. (7 to 17 inches thick)

C3—20 to 47 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; soft, friable,

sticky and slightly plastic; common fine roots; common fine and very fine interstitial and tubular pores; violently effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (12 to 30 inches thick)

C4—47 to 60 inches; pale brown (10YR 6/3) loam, yellowish brown (10YR 5/4) moist; massive; soft, friable, slightly sticky and slightly plastic; few fine roots; few fine interstitial pores; violently effervescent; moderately alkaline (pH 8.0).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature ranges from 45 to 47 degrees F. The particle-size control section averages 18 to 35 percent clay. It is strongly effervescent or violently effervescent and is moderately alkaline to very strongly alkaline.

The A horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3.

The C horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 to 4. It commonly is silt loam or silty clay loam, but it has strata of fine sandy loam or loam below a depth of 40 inches in some pedons.

Fertaline Series

The Fertaline series consists of well drained, very slowly permeable soils that are moderately deep to a duripan. These soils are on fan piedmont remnants. They formed in alluvium derived from mixed rock with an admixture of volcanic ash. Slope is 2 to 8 percent. Elevation is 6,300 to 7,500 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Fertaline gravelly loam, 2 to 8 percent slopes, about 37 miles northwest of Eureka, in an area of Fertaline-Handy association, about 700 feet east and 2,200 feet south of the northwest corner of sec. 9, T. 23 N., R. 49 E.

A—0 to 5 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak very fine granular structure; soft, friable, sticky and plastic; many fine and very fine roots; many very fine interstitial pores and many very fine tubular pores; 20 percent pebbles and 5 percent cobbles; neutral (pH 6.8); clear smooth boundary. (4 to 6 inches thick)

E—5 to 8 inches; light brownish gray (10YR 6/2) very gravelly loam, brown (10YR 5/3) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, sticky and plastic; many fine and very fine roots; many very fine interstitial and tubular pores; 30 percent pebbles and 10 percent cobbles; neutral (pH 6.8); abrupt wavy boundary. (3 to 5 inches thick)

Bt—8 to 16 inches; light brown (7.5YR 6/4) clay, dark brown (10YR 4/4) moist; strong coarse prismatic structure; very hard, very firm, very sticky and very plastic; common fine and very fine roots; common fine and very fine tubular pores; 5 percent pebbles and 5 percent cobbles; neutral (pH 7.0); clear smooth boundary. (8 to 12 inches thick)

Btk—16 to 20 inches; pale brown (10YR 6/3) gravelly clay, brown (10YR 4/3) moist; moderate coarse and medium angular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots; common fine tubular pores; 15 percent pebbles and 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (4 to 5 inches thick)

Bqk—20 to 22 inches; pink (10YR 7/4) very gravelly loam, brown (10YR 5/4) moist; massive; slightly hard, firm, slightly sticky and slightly plastic; very few fine and very fine roots; common very fine interstitial pores; thin discontinuous weakly cemented plates; 35 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (0 to 3 inches thick)

Bqkm—22 to 28 inches; very pale brown (10YR 7/3) and white (10YR 8/2) indurated duripan, light gray (10YR 7/2) and pale brown (10YR 6/3) moist; massive; extremely hard, extremely firm; few very fine interstitial pores; violently effervescent; strongly alkaline (pH 8.8).

These soils are usually dry; they are moist in winter and spring but are dry in mid-June to October. The mean annual soil temperature is 43 to 46 degrees F. Depth to the indurated duripan is 20 to 30 inches. Where mixed, the argillic horizon averages 45 to 60 percent clay and 10 to 15 percent pebbles and cobbles. The A, E, and Bt horizons are noneffervescent, and the Btk and Bqk horizons are strongly effervescent or violently effervescent.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. The horizon has platy or granular structure. It is neutral or mildly alkaline.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6 when dry and 4 or 5 when moist, and chroma of 3 or 4. Texture is clay or gravelly clay. Structure is prismatic or angular blocky. The lower part of the horizon has free lime in some pedons. The horizon is neutral to moderately alkaline.

Fortank Series

The Fortank series consists of moderately deep, well drained, slowly permeable soils on the sides of low hills and mountains. These soils formed in residuum derived from andesite, rhyolite, tuff, and quartzite. Slope is 4 to 50 percent. Elevation is 5,000 to 7,500 feet. The mean annual precipitation is about 9 inches, and the mean

annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Fortank gravelly loam, 15 to 30 percent slopes, about 7 miles east of Crescent Valley, in an area of Soughe-Fortank-Kodra Variant association, about 2,100 feet south and 500 feet west of the northeast corner of sec. 33, T. 30 N., R. 49 E.

About 45 percent of the surface is covered with rock fragments, of which 5 percent is cobbles and 40 percent is pebbles.

A1—0 to 5 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium and thick platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine vesicular and tubular pores and few fine tubular pores; 30 percent pebbles; moderately alkaline (pH 8.0); abrupt smooth boundary. (3 to 6 inches thick)

A2—5 to 10 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/5) moist; weak very thin platy structure; soft, very friable, sticky and plastic; many very fine roots and few fine roots; many very fine vesicular pores; 15 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 6 inches thick)

Bt1—10 to 14 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 4/3) moist; weak medium and coarse angular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots and few medium roots; many very fine and few fine tubular pores; many thin clay films lining pores; 30 percent pebbles; moderately alkaline (pH 8.4); clear wavy boundary. (3 to 5 inches thick)

Bt2—14 to 24 inches; brown (10YR 5/3) gravelly clay, brown (7.5YR 5/4) moist; moderate medium prismatic structure parting to moderate medium angular blocky; hard, friable, very sticky and very plastic; few very fine and fine roots and few medium roots; many very fine tubular pores; continuous thin clay films on ped faces and lining pores; 25 percent pebbles; moderately alkaline (pH 8.4); clear wavy boundary. (8 to 11 inches thick)

Btk—24 to 35 inches; brown (7.5YR 5/4) gravelly clay, dark brown (7.5YR 4/4) moist; weak medium prismatic structure parting to moderate medium angular blocky; hard, friable, very sticky and very plastic; few very fine roots; many very fine tubular and interstitial pores; continuous moderately thick clay films lining pores and on ped faces; many fine lime filaments; 25 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (8 to 12 inches thick)

Cr—35 to 42 inches; weathered andesitic tuff.

These soils are usually dry; they are moist in winter and spring but are dry in mid-June to October. The mean annual soil temperature is about 45 to 47 degrees F. Depth to bedrock is 30 to 40 inches. The upper 20 inches of the argillic horizon averages 35 to 45 percent clay. It is clay or clay loam modified with 15 to 35 percent rock fragments.

The A horizon has value of 3 or 4 when moist. It has weak very thin to moderate medium platy structure.

The Bt horizon has hue of 7.5YR to 10YR, value of 5 or 6 when dry and 4 or 5 when moist, and chroma of 3 or 4. It has weak or moderate, medium or coarse, angular blocky structure or weak or moderate, medium, prismatic structure.

Foxmount Series

The Foxmount series consists of moderately deep, well drained, moderately permeable soils on side slopes of mountains. These soils formed in residuum and colluvium derived from andesite and rhyolite. Slope is 15 to 50 percent. Elevation is 7,500 to 9,000 feet. The mean annual precipitation is about 18 inches, and the mean annual temperature is about 42 degrees F. The frost-free season is 40 to 50 days.

Typical pedon of a Foxmount loam, 15 to 50 percent slopes, in an area of Foxmount-Winu-Hackwood association, about 37 miles northwest of Eureka, about 900 feet west and 2,000 feet north of the southeast corner of sec. 28, T. 22 N., R. 48 E.

A1—0 to 3 inches; very dark brown (10YR 2/2) loam, black (10YR 2/l) moist; weak fine subangular blocky structure; soft, friable, nonsticky and nonplastic; many fine and very fine interstitial pores; 10 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (2 to 3 inches thick)

A2—3 to 15 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderately medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 35 percent pebbles, 5 percent cobbles, and 5 percent stones; neutral (pH 7.0); clear smooth boundary. (8 to 12 inches thick)

Bw—15 to 32 inches; yellowish brown (10YR 5/4) very cobbly loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine interstitial pores; 30 percent pebbles, 20 percent cobbles, and 5 percent stones; neutral (pH 7.0); gradual smooth boundary. (12 to 19 inches thick)

C—32 to 37 inches; yellowish brown (10YR 5/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine roots; few fine interstitial pores; 20 percent pebbles, 25 percent cobbles, and

20 percent stones; neutral (pH 7.0); abrupt wavy boundary. (0 to 6 inches thick)
Cr—37 inches; weathered rhyolite.

These soils are moist in winter and spring, and they are dry late in June to mid-October. The mean annual soil temperature ranges from 39 to 42 degrees F. The mean summer soil temperature ranges from 43 to 47 degrees. in areas of under dense mahogany where an Oi horizon is present, but it is as high as 53 to 57 degrees in open areas that do not have an Oi horizon. Thickness of the A and Bw horizons ranges from 20 to 32 inches, and thickness of the mollic epipedon ranges from 10 to 15 inches. Depth to paralithic contact ranges from 24 to 40 inches. The particle-size control section is dominantly loam, but it includes fine sandy loam or sandy loam. It is modified with 35 to 80 percent pebbles, cobbles, and stones, but it averages 50 to 70 percent. The rock fragment content commonly increases with increasing depth. Reaction is slightly acid or neutral.

The A horizon has value of 2 to 5 when dry and 2 or 3 when moist, and it has chroma of 1 or 2. It has granular or subangular blocky structure.

The Bw horizon has value of 5 or 6 when dry and 3 or 4 when moist.

Freznik Series

The Freznik series consists of moderately deep, moderately well drained, very slowly permeable soils on side slopes of mountains. These soils formed in residuum derived mainly from tuff with minor amounts of chert and quartz latite. Slope is 15 to 30 percent. Elevation is 6,400 to 7,000 feet. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Freznik very stony clay loam, 15 to 30 percent slopes, in an area of Freznik-Whitepeak association; about 14 miles south and 6 miles east of Crescent Valley, about 1,600 feet west and 1,600 feet north of the southeast corner of sec. 17, T. 27 N., R. 49 E.

About 30 percent of the surface is covered with stones and cobbles.

A—0 to 3 inches; dark grayish brown (10YR 4/2) very stony clay loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; hard, very friable, sticky and very plastic; many very fine and fine roots; many very fine tubular pores; 20 percent pebbles and 10 percent stones; neutral (pH 7.2); abrupt wavy boundary. (2 to 4 inches thick)
Bt1—3 to 9 inches; brown (10YR 5/3) gravelly clay, dark brown (10YR 4/3) moist; few fine distinct mottles that are reddish yellow (7.5YR 6/8) and strong brown (7.5YR 5/6) when moist; strong medium prismatic structure; very hard, friable, very sticky and very plastic; common very fine and fine roots; few very fine tubular pores; many shiny pressure faces on peds; 20 percent pebbles; neutral (pH 7.0); clear wavy boundary. (6 to 9 inches thick)
Bt2—9 to 15 inches; brown (10YR 5/3) gravelly clay, dark brown (10YR 4/3) moist; few fine distinct reddish yellow (7.5YR 6/8) mottles, strong brown (7.5YR 5/6) moist; moderate medium prismatic structure; very hard, firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; many shiny pressure faces on peds; 20 percent pebbles; neutral (pH 7.0); clear wavy boundary. (4 to 7 inches thick)
Bt3—15 to 21 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; brown (10YR 5/2) organic matter stains, dark brown (10YR 4/2) moist; common fine distinct reddish yellow (7.5YR 6/8) mottles, strong brown (7.5YR 5/6) moist; moderate fine and medium subangular blocky structure; very hard, firm, very sticky and very plastic; few very fine, fine, and medium roots; few very fine tubular pores; many shiny pressure faces on peds; 15 percent pebbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (5 to 10 inches thick)
Bt4—21 to 36 inches; reddish yellow (7.5YR 6/6) gravelly clay, strong brown (7.5YR 5/6) moist; brown (10YR 5/2) organic matter stains, dark brown (10YR 4/2) moist; common fine distinct strong brown (7.5YR 5/8) mottles; massive; hard, firm, very sticky and very plastic; few very fine and fine roots; common very fine tubular pores; many shiny pressure faces on peds; 30 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (5 to 15 inches thick)
R—36 inches; consolidated tuff and quartz latite.

These soils are moist in winter and spring, and they are dry late in June to October. The mean annual soil temperature is 44 to 47 degrees F. Depth to bedrock is 20 to 40 inches. The particle-size control section has 50 to 60 percent clay and averages 15 to 35 percent rock fragments, mostly pebbles. Reaction is neutral to moderately alkaline.

The A horizon has value of 4 or 5 when dry and 3 or 4 when moist, and it has chroma of 1 to 3.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6 when dry and 4 or 5 when moist, and chroma of 3 to 6. It is dominantly gravelly clay, but strata of clay are common.

Gando Series

The Gando series consists of shallow, well drained, moderately permeable soils on mountain crests and side slopes. These soils formed in residuum derived from mixed sedimentary rocks. Slope is 15 to 75 percent.

Elevation is 6,200 to 8,200 feet. The mean annual precipitation is about 16 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 70 to 90 days.

Typical pedon of a Gando extremely stony loam, 50 to 75 percent slopes, in an area of Glean-Gando association, about 40 miles south of Crescent Valley, about 2,310 feet west and 660 feet south of the northeast corner of sec. 4, T. 22 N., R. 48 E.

A1—0 to 5 inches; brown (10YR 5/3) extremely stony loam, very dark grayish brown (10YR 3/2) moist; weak medium granular structure; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; many very fine interstitial pores; 20 percent pebbles, 5 percent cobbles, and 15 percent stones; mildly alkaline (pH 7.6); clear wavy boundary. (4 to 7 inches thick)

A2—5 to 12 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine and very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; many very fine interstitial pores; 40 percent pebbles, 10 percent cobbles, and 5 percent stones; mildly alkaline (pH 7.6); gradual wavy boundary. (5 to 7 inches thick)

Bk—12 to 15 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; massive; soft, friable, slightly sticky and slightly plastic; few fine and very fine roots; many very fine interstitial pores; 60 percent pebbles, 10 percent cobbles, and 5 percent stones; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 6 inches thick)

R—15 inches; fractured chert.

These soils are usually dry; they are moist in winter and spring but are dry late in June to mid-October. The mean annual soil temperature is about 44 to 46 degrees F. The mollic epipedon is 7 to 14 inches thick. Depth to lithic contact ranges from 12 to 20 inches. The particle-size control section is loam modified with 50 to 70 percent rock fragments, mainly pebbles and some cobbles and stones. The upper part of the profile is noneffervescent, and the lower part is slightly effervescent or strongly effervescent.

The A horizon has value of 4 or 5 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. It has granular or subangular blocky structure. It is mildly alkaline or moderately alkaline.

The Bk horizon has value of 5 or 6 when dry and 4 or 5 when moist, and it has chroma of 3 or 4. It is mildly alkaline or moderately alkaline.

Glean Series

The Glean series consists of deep, well drained, moderately rapidly permeable soils on side slopes of mountains. These soils formed in residuum and colluvium derived from chert, shale, and volcanic rock. Slope is 15 to 75 percent. Elevation is 6,500 to 8,200 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 50 to 80 days.

Typical pedon of a Glean very gravelly loam, 15 to 30 percent slopes, in the Loncan-Gando-Glean association, about 40 miles south of Crescent Valley, about 250 feet east and 2,100 feet north of the southwest corner of sec. 14, T. 23 N., R. 48 E.

A1—0 to 14 inches; dark brown (10YR 4/3) very gravelly loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; many medium, fine, and very fine roots; many fine and very fine interstitial pores; 35 percent pebbles; neutral (pH 7.2); gradual smooth boundary. (12 to 17 inches thick)

A2—14 to 21 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, friable, nonsticky and nonplastic; common fine and very fine roots; many fine and very fine interstitial pores; 35 percent pebbles; neutral (pH 7.2); gradual smooth boundary. (6 to 10 inches thick)

AC—21 to 33 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine angular blocky structure; hard, friable, nonsticky and nonplastic; few medium and fine roots; common fine and very fine interstitial pores; 45 percent pebbles; neutral (pH 7.4); gradual smooth boundary. (9 to 15 inches thick)

C—33 to 56 inches; brown (10YR 5/3) very gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few medium roots; common fine and very fine interstitial pores; 55 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (20 to 25 inches thick)

R—56 to 60 inches; chert.

These soils are dry in July to October, but they are moist in winter and spring. The mean annual soil temperature ranges from 43 to 47 degrees F. Where mixed, the particle-size control section is sandy loam or loam modified with 40 to 70 percent pebbles, cobbles, or stones. Rock fragment content increases with increasing depth. Depth to bedrock ranges from 50 to 60 inches. The profile is slightly acid or neutral.

The A horizon has value of 3 or 4 when dry and 2 or 3 when moist, and it has chroma of 2 or 3. It has granular or subangular blocky structure.

The AC horizon has value of 5 or 6 when dry and 3 or 4 when moist. It has subangular blocky or angular blocky structure.

The C horizon has value of 5 or 6 when dry and 3 to 5 when moist.

Granzan Series

The Granzan series consists of deep, well drained, moderately permeable soils on side slopes of mountains. These soils formed in residuum and colluvium derived from limestone and calcareous shale. Slope is 30 to 75 percent. Elevation is 7,000 to 9,000 feet. The mean annual precipitation is about 16 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Granzan very gravelly loam, 30 to 75 percent slopes, in an area of Granzan Variant-Granzan-Highams Variant association, about 19 miles south of Crescent Valley, about 500 feet west and 500 feet south of the northeast corner of sec. 5, T. 26 N., R. 48 E.

A1—0 to 2 inches; grayish brown (10YR 5/2) very gravelly loam, very dark brown (10YR 2/2) moist; moderate very fine and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine tubular pores; 40 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (2 to 4 inches thick)

A2—2 to 7 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and plastic; many very fine and fine roots; common very fine and few fine tubular pores; 45 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (3 to 6 inches thick)

A3—7 to 14 inches; grayish brown (10YR 5/2) very gravelly silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; soft, very friable, sticky and plastic; common very fine and fine roots and few medium and coarse roots; common very fine tubular pores; 50 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (6 to 9 inches thick)

Bk1—14 to 25 inches; pale brown (10YR 6/3) very gravelly silt loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots and few medium roots; many very fine tubular pores; few fine lime filaments and coatings on the underside of pebbles; 45 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary. (1 to 11 inches thick)

Bk2—25 to 35 inches; pale brown (10YR 6/3) very gravelly silt loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, sticky and plastic; many very fine and fine roots and few medium roots; many very fine tubular pores; common fine lime filaments and coatings on the underside of pebbles; 50 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary. (8 to 12 inches thick)

Bk3—35 to 49 inches; pale brown (10YR 6/3) very gravelly silt loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, sticky and plastic; few very fine and fine roots; many very fine tubular pores; thin lime coatings on the underside of pebbles; 15 percent cobbles and 45 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (7 to 18 inches thick)

R—49 inches; calcareous shale.

These soils are moist in winter and spring, but they are dry in mid-July to September. The mean annual soil temperature is 43 to 45 degrees F. The mollic epipedon is 11 to 19 inches thick. Depth to bedrock is 40 to 60 inches. The particle-size control section is loam or silt loam; it is 18 to 27 percent clay modified with 35 to 60 percent rock fragments, mainly pebbles. Calcium carbonate equivalent is 40 to 50 percent.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3. It has granular or subangular blocky structure.

The Bk horizon has value of 6 or 7 when dry and 3 or 4 when moist, and it has chroma of 3 or 4. It is dominantly very gravelly silt loam or very gravelly loam, but extremely gravelly loam is in the lower part of some pedons.

Granzan Variant

The Granzan Variant consists of moderately deep, well drained, moderately permeable soils on side slopes of mountains. These soils formed in residuum derived from limestone and calcareous shale. Slope is 30 to 75 percent. Elevation is 7,000 to 9,000 feet. The mean annual precipitation is about 16 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Granzan Variant very gravelly loam, 30 to 75 percent slopes, in an area of Granzan Variant-Granzan-Highams Variant association, about 19 miles south and 1 mile east of Crescent Valley, about 1,300 feet east and 2,400 feet north of the southwest corner of sec. 4, T. 26 N., R. 48 E.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark brown (10YR 2/2) moist; strong very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial and tubular pores; 45 percent pebbles; strongly effervescent;

moderately alkaline (pH 8.2); clear wavy boundary. (2 to 6 inches thick)

A2—4 to 10 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots and few fine and medium roots; common very fine tubular pores; 45 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (3 to 7 inches thick)

A3—10 to 14 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium and coarse roots; common very fine tubular pores; 45 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (2 to 5 inches thick)

AC—14 to 24 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 3/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium and coarse roots; common very fine tubular pores; 55 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt irregular boundary. (6 to 12 inches thick)

C—24 to 30 inches; very pale brown (10YR 7/3) very gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine, fine, medium, and coarse roots; common very fine tubular pores; 40 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (5 to 8 inches thick)

Ck—30 to 36 inches; light gray (10YR 7/2) very gravelly loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; 40 percent pebbles; common thin lime filaments and thin lime coatings on the underside of pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (6 to 8 inches thick)

Cr—36 to 50 inches; weathered, interbedded shale and limestone.

R—50 inches; fractured, unweathered, interbedded shale and limestone.

These soils are usually dry; they are moist in winter and spring but are dry in summer and early in autumn. The mean annual soil temperature is 44 to 47 degrees F. Depth to paralithic contact is 26 to 40 inches. Depth to the calcic horizon is 20 to 30 inches. The particle-size control section averages 10 to 15 percent clay and 40 to 50 percent rock fragments, dominantly pebbles. The mollic epipedon is 10 to 18 inches thick. The calcium carbonate equivalent is 20 to 40 percent in the A and C horizons.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3. It has moderate to strong, granular or subangular blocky structure.

The C horizon has value of 6 or 7 when dry and 3 to 5 when moist.

These soils are a variant of the Granzan series because they have less than 40 percent calcium carbonate equivalent in the control section.

Hackwood Series

The Hackwood series consists of very deep, moderately well drained, moderately permeable soils on concave side slopes of mountains. These soils formed in colluvium derived from volcanic rock with a strong influence of loess. Slope is 15 to 30 percent. Elevation is 7,800 to 8,500 feet. The mean annual precipitation is about 18 inches, and the mean annual temperature is about 41 degrees F. The frost-free season is 50 to 60 days.

Typical pedon of a Hackwood bouldery silt loam, 15 to 30 percent slopes, in an area of Foxmount-Winu-Hackwood association, about 30 miles northwest of Eureka, about 800 feet west and 1,500 feet south of the northeast corner of sec. 28, T. 22 N., R. 48 E.

From 1 to 3 percent of the surface is covered with boulders.

A1—0 to 9 inches; dark grayish brown (10YR 4/2) bouldery silt loam, very dark brown (10YR 2/2) moist; strong fine and very fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few medium roots and many fine and very fine roots; many very fine interstitial pores and many very fine tubular pores; 5 percent pebbles and 5 percent cobbles; slightly acid (pH 6.4); gradual smooth boundary. (8 to 12 inches thick)

A2—9 to 17 inches; dark brown (10YR 4/3) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium roots and many fine and very fine roots; many very fine interstitial pores and many very fine tubular pores; 5 percent pebbles and 5 percent cobbles; neutral (pH 6.8); gradual smooth boundary. (7 to 10 inches thick)

AC—17 to 24 inches; yellowish brown (10YR 5/4) silt loam, dark yellowish brown (10YR 3/4) moist; moderate medium angular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few medium roots and common fine and very fine roots; many very fine interstitial pores and many very fine tubular pores; 5 percent pebbles and 5 percent cobbles; neutral (pH 6.8); clear wavy boundary. (6 to 10 inches thick)

2C—24 to 37 inches; yellowish brown (10YR 5/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, firm, sticky and plastic; common fine and very fine roots; many very fine interstitial pores and many very fine tubular pores; 25 percent pebbles and 5 percent cobbles; neutral (pH 6.8); clear wavy boundary. (10 to 16 inches thick)

3C1—37 to 45 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few fine and very fine roots; many very fine interstitial pores and common very fine tubular pores; 30 percent pebbles and 5 percent cobbles; neutral (pH 6.8); clear wavy boundary. (7 to 13 inches thick)

3C2—45 to 60 inches; very pale brown (10YR 7/3) very gravelly loam, brown (10YR 5/3) moist; massive; hard, firm, nonsticky and nonplastic; few fine and very fine roots; many very fine interstitial pores; thin silt coatings or uncoated sand grains in pores; 35 percent pebbles and 5 percent cobbles; neutral (pH 6.8)

These soils are moist late in fall to summer, and they are dry in September and October. Additional soil moisture is supplied by lateral water movement in the lower part of the control section or in the C horizon. The mean annual soil temperature is 38 to 44 degrees F. The mean summer soil temperature is 43 to 47 degrees F. The mollic epipedon is 16 to 22 inches thick. The particle-size control section averages gravelly silt loam or gravelly loam. The 3C horizon is very gravelly loam to very gravelly silty clay loam. The control section averages 18 to 30 percent clay and 15 to 35 percent rock fragments, mainly pebbles and a few cobbles or stones in some pedons. Reaction is slightly acid or neutral.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 1 to 3 when dry and 1 or 2 when moist. Structure is platy, subangular blocky, or granular.

The C horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3. The pores in the lower part of the C horizon are lined with very thin silt coatings or uncoated sand grains.

Handy Series

The Handy series consists of very deep, well drained, slowly permeable soils on fan piedmonts. These soils formed in alluvium derived from mixed volcanic rock. Slope is 2 to 15 percent. Elevation is 6,000 to 7,500 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of Handy loam, 2 to 8 percent slopes, about 20 miles west and 19 miles north of Eureka, about 1,500 feet north and 50 feet east of the southwest corner of sec. 33, T. 23 N., R. 49 E.

A—0 to 3 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; few fine and very fine roots; many very fine vesicular pores; 5 percent pebbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (2 to 4 inches thick)

BA—3 to 9 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and very fine roots; common fine and very fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (2 to 7 inches thick)

Bt1—9 to 13 inches; pale brown (10YR 6/3) clay, brown (10YR 4/3) moist; moderate medium and fine angular blocky structure; hard, firm, very sticky and very plastic; common fine and very fine roots; few very fine tubular pores; common moderately thick pressure faces on peds; 5 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (4 to 8 inches thick)

Bt2—13 to 21 inches; pale brown (10YR 6/3) clay, brown (10YR 4/3) moist; moderate medium prismatic structure parting to strong medium angular blocky; hard, firm, very sticky and very plastic; few fine and very fine roots; few very fine tubular pores; many thick pressure faces on peds; 5 percent pebbles; moderately alkaline (pH 8.0); clear wavy boundary. (7 to 12 inches thick)

2Bk1—21 to 42 inches; brownish yellow (10YR 6/6) very gravelly sandy loam, dark yellowish brown (10YR 4/6) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine and very fine interstitial pores; 45 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); clear irregular boundary. (18 to 30 inches thick)

2Bk2—42 to 60 inches; very pale brown (10YR 7/4) very gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; common fine and very fine interstitial pores; 55 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 45 to 47 degrees F. Depth to secondary carbonates is 15 to 22 inches. The A and Bt horizons are mildly alkaline or moderately alkaline, and the Bk horizon is moderately alkaline or strongly alkaline.

The A horizon has value of 4 to 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. Structure is platy or granular.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6 when dry and 4 or 5 when moist, and chroma of 3 or 4. It has moderate or strong, angular blocky or prismatic structure. It is clay loam or clay; it averages 40 to 50 percent clay and 0 to 20 percent pebbles.

The Bk horizon is stratified gravelly loam to very gravelly loamy sand. It is strongly effervescent or violently effervescent.

Hapgood Series

The Hapgood series consists of deep, well drained, moderately permeable soils on side slopes of mountains. These soils formed in residuum and colluvium derived from andesite with some influence of loess and volcanic ash. Slope is 15 to 30 percent. Elevation is 7,000 to 9,500 feet. The mean annual precipitation is about 18 inches, and the mean annual temperature is about 41 degrees F. The frost-free season is 50 to 70 days.

Typical pedon of a Hapgood very gravelly loam, 15 to 30 percent slopes, in an area of Decram-Hapgood association, about 23 miles south of Cortez, about 1,400 feet south and 1,200 feet east of the northwest corner of sec. 2, T. 22 N., R. 48 E.

A1—0 to 3 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; moderate fine granular structure; few coarse and medium roots and many fine and very fine roots; few medium and many fine and very fine tubular pores; 35 percent pebbles; neutral (pH 6.8); clear wavy boundary. (2 to 4 inches thick)

A2—3 to 12 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; few medium roots and many fine and very fine roots; few medium and many fine and very fine tubular pores; 35 percent pebbles and neutral (pH 6.8); clear wavy boundary. (7 to 9 inches thick)

A3—12 to 28 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; many fine and very fine tubular pores; 50 percent pebbles; neutral (pH 6.8); gradual wavy boundary. (15 to 17 inches thick)

A4—28 to 45 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine and common very fine roots; many fine and very fine tubular pores; 50 percent pebbles; neutral (pH 6.8); abrupt wavy boundary. (12 to 18 inches thick)

R—45 inches; andesite.

These soils are moist in winter and spring; they are dry in July to early in October. The mean annual soil temperature ranges from 40 to 45 degrees F. Thickness of the mollic epipedon and depth to bedrock range from 40 to 48 inches. Reaction is slightly acid or neutral throughout the profile.

The A horizon has value of 3 to 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3. Content of rock fragments, mainly pebbles, ranges from 35 to 50 percent. The horizon is very gravelly loam or very gravelly fine sandy loam; it is 18 to 27 percent clay.

The C horizon, where present, has value of 4 to 6 when dry and 3 to 5 when moist, and it has chroma of 2 or 3.

Hatur Series

The Hatur series consists of moderately deep, well drained, moderately permeable soils on side slopes of mountains. These soils formed in residuum and colluvium derived from limestone and dolomite. Slope is 15 to 50 percent. Elevation is 8,000 to 9,500 feet. The mean annual precipitation is about 16 inches, and the mean annual temperature is about 42 degrees F. The frost-free season is about 60 days.

Typical pedon of a Hatur very gravelly loam, 15 to 50 percent slopes, in the Haunchee-Hatur-Rock outcrop association, about 32 miles northwest of Eureka, about 1,200 feet north and 800 feet west of the southeast corner of sec. 32, T. 23 N., R. 50 E.

A1—0 to 4 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many medium, fine, and very fine roots; common fine interstitial and tubular pores; 40 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); gradual smooth boundary. (3 to 7 inches thick)

A2—4 to 10 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many medium, fine, and very fine roots; common fine and very fine tubular pores; 45 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (5 to 7 inches thick)

Bw—10 to 19 inches; brown (10YR 5/3) extremely gravelly loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common medium and fine roots; common medium and fine tubular pores; 65 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); gradual smooth boundary. (5 to 11 inches thick)

C—19 to 35 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 65 percent pebbles and 10 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (7 to 17 inches thick)
R—35 inches; limestone.

These soils are usually moist, but they are dry for 45 to 60 consecutive days late in summer and in fall. The mean annual soil temperature is 44 to 46 degrees F, and the mean summer soil temperature is 52 to 56 degrees. Depth to bedrock is 20 to 40 inches. The particle-size control section is extremely gravelly loam or extremely gravelly sandy loam with 60 to 80 percent rock fragments. The calcium carbonate equivalent is 60 to 80 percent. The mollic epipedon is 10 to 14 inches thick.

The A horizon has value of 4 or 5 when dry, and it has chroma of 2 or 3.

The Bw horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 3 or 4.

The C horizon has value of 4 or 5 when moist, and it has chroma of 2 or 3.

Haunchee Series

The Haunchee series consists of shallow, well drained, moderately permeable soils on mountain crests and upper side slopes. These soils formed in residuum derived from dolomite and limestone. Slope is 30 to 75 percent. Elevation is 7,500 to 9,500 feet. The mean annual precipitation is about 16 inches, and the mean annual temperature is about 42 degrees F. The frost-free season is less than 50 days.

Typical pedon of a Haunchee very gravelly loam, 30 to 75 percent slopes, in an area of Foxmount-Haunchee-Rock outcrop association, about 5 miles south of Eureka, about 200 feet east and 1,500 feet south of the northwest corner of sec. 14, T. 18 N., R. 53 E.

A1—0 to 4 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many medium, fine, and very fine roots; many fine and very fine interstitial pores; 35 percent pebbles; strongly effervescent; mildly alkaline (pH 7.8); clear smooth boundary. (3 to 7 inches thick)
A2—4 to 12 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; many fine and very fine interstitial pores; 45 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); abrupt irregular boundary. (7 to 13 inches thick)
R—12 inches; fractured limestone.

These soils are usually moist in winter and spring; they are dry in mid-July to October. The mean annual soil temperature is 42 to 45 degrees F, and the mean summer soil temperature at the lithic contact is 55 to 59 degrees. The depth to bedrock is 10 to 20 inches. The particle-size control section has 35 to 60 percent rock fragments, mainly pebbles and some cobbles and stones. It is 40 to 70 percent calcium carbonate equivalent. The mollic epipedon is 10 to 20 inches thick and overlies the bedrock. It is strongly effervescent or violently effervescent throughout. The profile is mildly alkaline or moderately alkaline in the A horizon and is moderately alkaline or strongly alkaline below.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5 when dry and 2 or 3 when moist, and chroma of 2 or 3. It commonly has granular structure, but it has subangular blocky structure in some pedons.

The C horizon, where present, has hue of 10YR or 2.5Y, value of 5 to 8 when dry and 3 to 7 when moist, and chroma of 2 to 4.

Hayeston Series

The Hayeston series consists of very deep, well drained, moderately rapidly permeable soils on inset fans. These soils formed in alluvium derived from various kinds of rock. Slope is 0 to 4 percent. Elevation is 5,800 to 7,100 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Hayeston sandy loam, 0 to 4 percent slopes, about 12 miles northwest of Eureka, about 1,100 feet north and 1,500 feet east of the northwest corner of sec. 23, T. 20 N., R. 51 E.

A—0 to 4 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; moderate medium platy structure; slightly hard, friable, nonsticky and nonplastic; few very fine roots; many fine and very fine vesicular pores; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (3 to 6 inches thick)
C1—4 to 16 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (ll to 28 inches thick)
C2—16 to 27 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; many fine and very fine roots, common fine and very fine interstitial pores; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 19 inches thick)

2C1—27 to 46 inches; very pale brown (10YR 7/3) very gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; many fine and very fine interstitial pores; 55 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (ll to 33 inches thick)
2C2—46 to 60 inches; very pale brown (10YR 8/3) extremely gravelly loamy sand, pale brown (10YR 6/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine roots; common fine and very fine interstitial pores; 65 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6).

These soils are usually dry; they are moist in winter and spring but are dry from mid-June to October. The mean annual soil temperature is about 45 to 47 degrees F. The particle-size control section averages 5 to 18 percent clay (mostly less than 12 percent), and it averages less than 35 percent rock fragments. Between depths of 10 and 25 inches or more, the dominant texture is sandy loam, fine sandy loam, or coarse sandy loam that is more than 50 percent sand that is fine or coarser. A layer of very gravelly loamy sand to extremely gravelly sand is at a depth of 25 to 40 inches. The soils are slightly calcareous or strongly calcareous throughout. They are moderately alkaline or strongly alkaline.

The A horizon has value of 5 or 6 when dry and 3 to 5 when moist, and it has chroma of 2 or 3.

The C horizon has value of 6 to 8 when dry and 4 to 7 when moist.

Highams Series

The Highams series consists of shallow, well drained, moderately permeable soils on side slopes of mountains. These soils formed in residuum derived from limestone and dolomite. Slope is 15 to 75 percent. Elevation is 5,200 to 7,800 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 42 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Highams very gravelly loam, 15 to 50 percent slopes, in an area of Quarz-Highams-Atrypa Variant association, about 32 miles south of Carlin, about 2,400 feet west and 250 feet south of the northwest corner of sec. 15, T. 26 N., R. 52 E.

A1—0 to 5 inches; light brownish gray (10YR 6/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; many very fine and fine tubular pores; 35 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary. (3 to 5 inches thick)
A2—5 to 10 inches; light brownish gray (10YR 6/2) very gravelly loam, dark brown (10YR 3/3) moist; massive; slightly hard, very friable, sticky and plastic; few fine and medium roots; common very fine and fine tubular pores; 25 percent pebbles and 10 percent cobbles; violently effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary. (3 to 5 inches thick)
C—10 to 13 inches; pale brown (10YR 6/3) very cobbly loam, dark brown (10YR 3/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores; 30 percent pebbles and 20 percent cobbles; lime coatings on the underside of rock fragments; violently effervescent; moderately alkaline (pH 8.2); abrupt irregular boundary. (2 to 7 inches thick)
R—13 inches; limestone.

These soils are usually dry; they are moist in winter and spring but are dry in June to early in October. The mean annual soil temperature is 44 to 46 degrees F. Depth to lithic contact is 10 to 17 inches. The particle-size control section is 18 to 27 percent clay and averages 35 to 60 percent rock fragments. The calcium carbonate equivalent is 40 to 50 percent.

The A horizon has value of 6 or 7 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. It is slightly effervescent to strongly effervescent. It has granular or platy structure or is massive.

The C horizon is massive or has weak subangular blocky structure.

Highams Variant

The Highams Variant consists of shallow, somewhat excessively drained, moderately permeable soils on mountain crests and upper side slopes. These soils formed in residuum derived from limestone and calcareous shale. Slope is 30 to 50 percent. Elevation is 7,000 to 9,000 feet. The mean annual precipitation is about 16 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Highams Variant very gravelly loam, 30 to 50 percent slopes, in an area of Granzan Variant-Granzan-Highams Variant association, about 19 miles south and 2 miles east of Crescent Valley, about 1,600 feet east and 1,000 feet north of the southwest corner of sec. 4, T. 26 N., R. 48 E.

A1—0 to 2 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate thick platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine vesicular pores; 10 percent cobbles and 35 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (2 to 4 inches thick)

A2—2 to 7 inches; grayish brown (2.5Y 5/2) gravelly loam, dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; common very fine tubular pores; 10 percent cobbles and 20 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (4 to 6 inches thick)

Bk—7 to 15 inches; gray (10YR 6/1) extremely gravelly very fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots and common medium and coarse roots; common very fine tubular and interstitial pores; lime pendants on the underside of pebbles; 20 percent cobbles and 60 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear irregular boundary. (7 to 12 inches thick)

Cr—15 to 43 inches; gray, soft, weathered, calcareous shale; many very fine roots and few medium and fine roots along fracture planes.

R—43 inches; hard, fractured, calcareous shale.

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 44 to 46 degrees F. Depth to paralithic contact is 14 to 20 inches. The particle-size control section averages 60 to 80 percent pebbles and cobbles and 8 to 15 percent clay. Depth to the calcic horizon is 7 to 10 inches.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist.

The Bk horizon has hue of 10YR or 2.5Y, value of 6 or 7 when dry and 4 or 5 when moist, and chroma of 1 or 2. The calcium carbonate equivalent is 40 to 50 percent.

These soils are a variant of the Highams series because they have a paralithic contact and a calcic horizon and they are calcareous throughout.

Hodedo Series

The Hodedo series consists of well drained, slowly permeable soils that are moderately deep to an indurated duripan. These soils are on fan piedmont remnants. They formed in alluvium derived from mixed rock. Slope is 2 to 30 percent. Elevation is 6,200 to 7,500 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 43 degrees F. Frost-free season is 80 to 100 days.

Typical pedon of Hodedo stony loam, 2 to 8 percent slopes, about 27 miles west of Eureka, about 2,620 feet east and 990 feet north of the southwest corner of sec. 5, T. 18 N., R. 49 E.

A—0 to 6 inches; pale brown (10YR 5/3) stony loam, dark brown (10YR 3/3) moist; moderate medium platy structure parting to moderate medium granular; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; many fine and very fine vesicular pores; 10 percent pebbles, 10 percent cobbles, and 5 percent stones; neutral (pH 7.0); clear smooth boundary. (6 to 10 inches thick)

Bt1—6 to 11 inches; brown (7.5YR 5/4) cobbly clay loam, dark brown (7.5YR 3/4) moist; weak medium angular blocky structure; slightly hard, friable, sticky and plastic; common fine and very fine roots; common fine and very fine interstitial and tubular pores; common thin pressure faces on peds; 15 percent pebbles, 10 percent cobbles, and 5 percent stones; neutral (pH 7.0); clear wavy boundary. (4 to 8 inches thick)

Bt2—11 to 20 inches; brown (7.5YR 5/4) gravelly clay loam, dark brown (7.5YR 3/4) moist; strong medium angular blocky structure; very hard, firm, very sticky and very plastic; common fine and very fine roots; common very fine tubular pores; common moderately thick pressure faces on peds; 20 percent pebbles and 10 percent cobbles; neutral (pH 7.0); abrupt wavy boundary. (7 to 12 inches thick)

Bqkm—20 to 29 inches; very pale brown (10YR 7/3) indurated duripan, yellowish brown (10YR 5/4) moist; massive; extremely hard, extremely firm; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (8 to 12 inches thick)

Cq—29 to 60 inches; pale brown (10YR 6/3) extremely cobbly loamy coarse sand, brown (10YR 4/3) moist; massive; hard, firm, nonsticky and nonplastic; common fine and very fine interstitial pores; continuous weak silica cementation; 20 percent pebbles, 30 percent cobbles, and 10 percent stones; mildly alkaline (pH 7.8).

These soils are usually dry; they are moist in winter and spring but are dry in July to October. The mean annual soil temperature is 44 to 47 degrees F. Depth to the indurated duripan is 20 to 26 inches. The mollic epipedon is 7 to 12 inches thick if the upper 7 inches is mixed, and it commonly includes the upper part of the argillic horizon. Reaction is slightly acid or neutral above the duripan. Some pedons are slightly calcareous in the lower part of the Bt horizon, but they do not have visible lime.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3. It has platy, granular, or subangular blocky structure.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5 when dry and 3 or 4 when moist, and chroma of 2 to 4. It has prismatic or angular blocky structure. The fine earth fraction is clay or clay loam; it is 35 to 45 percent clay modified with 15 to 35 percent rock fragments.

Hopeka Series

The Hopeka series consists of very shallow, well drained, moderately permeable soils on side slopes of mountains. These soils formed in residuum derived from dolomite and limestone. Slope is 8 to 50 percent. Elevation is 6,500 to 8,000 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 60 to 90 days.

Typical pedon of a Hopeka very gravelly loam, 8 to 15 percent slopes, in an area of Hopeka-Solak-Rock outcrop association, about 15 miles southwest of Eureka, about 2,300 feet south and 2,100 feet west of the northeast corner of sec. 32, T. 18 N., R. 52 E.

A—0 to 4 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium and thin platy structure; slightly hard, very friable, nonsticky and nonplastic; few fine roots; many fine and very fine vesicular pores; 35 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 4 inches thick)

C1—4 to 6 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few medium roots and many fine and very fine roots; many fine and very fine interstitial pores; 35 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (2 to 3 inches thick)

C2—6 to 9 inches; light gray (10YR 7/2) extremely gravelly loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common medium, fine, and very fine roots; common fine and very fine interstitial pores; 65 percent pebbles and 5 percent cobbles; violently effervescent; strongly alkaline (pH 8.6); clear irregular boundary. (0 to 4 inches thick)

R—9 inches; limestone.

These soils are usually dry; they are moist in winter and spring but are dry in June to mid-October. The mean annual soil temperature is 43 to 47 degrees F. Depth to bedrock is 4 to 10 inches. The profile averages 18 to 25 percent clay and 35 to 60 percent pebbles. The A and C horizons average 40 to 85 percent calcium carbonate equivalent. They commonly are violently effervescent but are strongly effervescent in the upper part in some pedons. They are moderately alkaline or strongly alkaline. The soils have value of 5 to 7 when dry and 3 or 4 when moist, and they have chroma of 2 or 3.

Humboldt Series

The Humboldt series consists of very deep, poorly drained, moderately slowly permeable soils on flood plains. These soils formed in silty mixed alluvium with an influence of volcanic ash. Slope is 0 to 2 percent. Elevation is 5,100 to 6,150 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 49 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of Humboldt loam, drained, slightly saline, rarely flooded; about 22 miles south of Carlin; about 2,500 feet north and 250 feet west of the southeast corner of sec. 20, T. 29 N., R. 52 E.

A—0 to 10 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; few fine distinct light yellowish brown (10YR 6/4) mottles, yellowish brown (10YR 5/4) moist; moderate coarse prismatic structure; hard, very friable, slightly sticky and plastic; few medium roots and many fine and very fine roots; many very fine interstitial and tubular pores; strongly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (10 to 12 inches thick)

C—10 to 13 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate coarse prismatic structure; hard, very friable, sticky and plastic; common fine and very fine roots; many fine and very fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (5 to 7 inches thick)

Akb1—13 to 20 inches; gray (10YR 5/1) silty clay, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure; hard, friable, very sticky and very plastic; common fine and very fine roots; few medium roots and many fine and very fine tubular pores; strongly effervescent; common fine lime filaments; very strongly alkaline (pH 9.2); clear wavy boundary. (6 to 8 inches thick)

Akb2—20 to 26 inches; gray (10YR 5/1) silty clay, very dark grayish brown (10YR 3/2) moist; massive; hard, firm, very sticky and very plastic; few medium roots and fine and very fine roots; many fine and very fine tubular pores; violently effervescent; few fine lime filaments; very strongly alkaline (pH 9.2); clear wavy boundary. (5 to 7 inches thick)

Ckb1—26 to 37 inches; light gray (10YR 7/1) silty clay loam, dark grayish brown (10YR 4/2) moist; common fine distinct brownish yellow (10YR 6/6) iron mottles, yellowish brown (10YR 5/6) moist; massive; hard, friable, sticky and very plastic; few fine and very fine roots; many fine and very fine tubular pores; continuous thin clay films lining pores; common fine lime filaments; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (10 to 12 inches thick)

Ckb2—37 to 57 inches; light gray (10YR 7/1) silty clay, brown (10YR 5/3) moist; common fine distinct reddish yellow (7.5YR 6/6) iron mottles, brown (7.5YR 4/4) moist; massive; hard, firm, very sticky and very plastic; few fine and very fine roots; few medium roots and many fine and very fine tubular

pores; continuous thin clay films lining pores; common fine lime filaments; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (15 to 25 inches thick)

Ckbq—57 to 65 inches; light gray (10YR 7/2) silty clay loam, brown (10YR 5/3) moist; common fine distinct light yellowish brown (10YR 6/4) iron mottles, strong brown (7.5YR 5/6) moist; massive; hard, friable, sticky and very plastic; few medium roots and many fine and very fine pores; continuous weak silica cementation; continuous thin and moderately thick clay films lining pores; common fine lime filaments; violently effervescent; strongly alkaline (pH 8.6)

Unless these soils are drained, they are usually saturated for 1 month or more during most years. The mean annual soil temperature ranges from 50 to 52 degrees F. The water table generally is at a depth of 0.5 and 2.0 feet, but in some drained areas it is at a depth of more than 6 feet. The mollic epipedon ranges from 10 to 12 inches thick. Reaction ranges from moderately alkaline to very strongly alkaline.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist.

The C horizon has value of 6 or 7 when dry and 3 to 5 when moist, and it has chroma of 1 to 3. It is clay, silty clay, or heavy silty clay loam.

Some of these soils are a taxadjunct to the Humboldt series because the frost-free season is 80 to 100 days, which is outside the range for the series. This difference, however, does not significantly affect use and management.

Hymas Series

The Hymas series consists of shallow, well drained, moderately permeable soils on side slopes of mountains. These soils formed in residuum derived from limestone and calcareous shale. Slope is 15 to 75 percent. Elevation is 5,200 to 8,000 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Hymas cobbly loam, 30 to 75 percent slopes, in an area of Solak-Highams-Hymas association, about 2,200 feet east and 2,000 feet south of the northwest corner of sec. 15, T. 18 N., R. 52 E.

A1—0 to 3 inches; grayish brown (10YR 5/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; many fine interstitial pores; 10 percent pebbles and 10 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (2 to 6 inches thick)

A2—3 to 9 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium and fine roots; common fine and very fine interstitial pores; 10 percent pebbles and 45 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (6 to 8 inches thick)

C—9 to 12 inches; pale brown (10YR 6/3) extremely cobbly loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common fine roots; common fine and very fine interstitial pores; 10 percent pebbles and 60 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); clear irregular boundary. (2 to 7 inches thick)

R—12 inches; limestone.

These soils are usually dry; they are moist in winter and spring but are dry in mid-June to October. The mean annual soil temperature is 42 to 47 degrees F. Depth to bedrock is 10 to 20 inches. The particle-size control section has more than 40 percent calcium carbonate equivalent in the fine earth fraction and including rock fragments less than 0.75 inch in diameter. It is dominantly medium textured and has 50 to 70 percent rock fragments, mainly angular limestone fragments. Thickness of the mollic epipedon is 7 to 14 inches.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3.

The C horizon has value of 5 to 8 when dry and 4 to 7 when moist, and it has chroma of 2 or 3.

Jesse Camp Series

The Jesse Camp series consists of very deep, well drained, moderately slowly permeable soils on inset fans and flood plains. These soils formed in silty alluvium derived mainly from volcanic rock with admixtures of volcanic ash. Slope is 0 to 2 percent. Elevation is 6,000 to 7,600 feet. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Jesse Camp silt loam, about 20 miles southwest of Eureka, about 50 feet south and 1,600 feet west of the northeast corner of sec. 18, T. 16 N., R. 52 E.

A—0 to 10 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, friable, nonsticky and nonplastic; few very fine roots; many medium vesicular pores; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (6 to 10 inches thick)

Bw—10 to 17 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and very fine roots;

many fine and very fine interstitial pores; slightly effervescent; moderately alkaline (pH 8.0); gradual smooth boundary. (6 to 7 inches thick)

Bk1—17 to 33 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; slightly hard, friable, sticky and plastic; common fine and very fine roots; many fine and very fine tubular pores; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary. (10 to 18 inches thick)

Bk2—33 to 55 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine tubular pores; few fine lime filaments; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary. (18 to 25 inches thick)

C—55 to 60 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine tubular pores; slightly effervescent; moderately alkaline (pH 8.0)

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature ranges from 45 to 47 degrees F. The thickness of the A and Bw horizons and depth to the Bk horizon range from 12 to 17 inches. Where mixed, the particle-size control section averages 18 to 27 percent clay and less than 15 percent weighted average, sand that is fine or coarser. Some pedons have strata of very fine sandy loam or silty clay loam. The A and Bw horizons are noneffervescent or slightly effervescent, and the Bk horizon is strongly effervescent or violently effervescent.

The A horizon has value of 3 or 4 when moist, and it has chroma of 2 or 3.

The Bw horizon has value of 6 or 7 when dry and 3 or 4 when moist. It has platy or subangular blocky structure.

The Bk horizon has value of 6 or 7 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. It has few to many lime segregations in the lower part. It is moderately alkaline or strongly alkaline.

Jivas Series

The Jivas series consists of deep, well drained, moderately permeable soils on side slopes of mountains. These soils formed in residuum and colluvium derived from mixed volcanic rock. Slope is 8 to 50 percent. Elevation is 6,400 to 8,100 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 42 degrees F. The frost-free season is 70 to 80 days.

Typical pedon of a Jivas gravelly loam, 15 to 30 percent slopes, in an area of Bregar-Jivas-Duff association, about 10 miles east and 10 miles south of Crescent Valley, about 1,050 feet west and 1,320 feet north of the southeast corner of sec. 25, T. 28 N., R. 49 E.

A1—0 to 6 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; strong medium and fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; common very fine tubular pores; 30 percent pebbles; neutral (pH 6.6); abrupt irregular boundary. (5 to 7 inches thick)

A2—6 to 12 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium and fine subangular blocky structure; slightly hard, very friable, sticky and plastic; many fine and very fine roots; many very fine tubular pores; 35 percent pebbles; neutral (pH 6.8); clear wavy boundary. (5 to 7 inches thick)

Bt1—12 to 18 inches; pale brown (10YR 6/3) extremely gravelly loam, dark brown (10YR 3/3) moist; moderate medium and fine subangular blocky structure; slightly hard, very friable, sticky and plastic; few thin clay films on ped faces and lining pores; 60 percent pebbles; neutral (pH 6.8); clear wavy boundary. (5 to 10 inches thick)

Bt2—18 to 32 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy clay loam, dark yellowish brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; slightly hard, very friable, sticky and plastic; few very fine roots; few fine and common very fine tubular pores; many thin clay films on ped faces and lining pores; 60 percent pebbles; neutral (pH 7.0); gradual wavy boundary. (12 to 20 inches thick)

Bt3—32 to 45 inches; light yellowish brown (10YR 6/4) extremely gravelly clay loam, dark yellowish brown (10YR 4/4) moist; weak medium and fine subangular blocky structure; hard, very friable, sticky and plastic; few very fine roots; few fine and common very fine tubular pores; few thin clay films on ped faces and lining pores; 55 percent pebbles and 5 percent cobbles; neutral (pH 7.0); abrupt wavy boundary. (l3 to 16 inches thick)

R—45 inches; rhyolite.

These soils are moist in winter and spring, and they are dry from July to October. The mean annual soil temperature is 43 to 47 degrees F. Depth to bedrock is 40 to 60 inches. The mollic epipedon is 10 to 14 inches thick. The argillic horizon has 20 to 30 percent clay and 60 to 75 percent rock fragments, mainly pebbles.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3.

The Bt horizon has value of 3 or 4 when moist, and it has chroma of 3 or 4. Texture is extremely gravelly loam, extremely gravelly sandy clay loam, and extremely gravelly clay loam.

Kobeh Series

The Kobeh series consists of very deep, somewhat excessively drained, moderately rapidly permeable soils on inset fans. These soils formed in alluvium derived from various kinds of rock with additions of volcanic ash. Slope is 0 to 8 percent. Elevation is 6,000 to 7,400 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Kobeh gravelly loam, 0 to 4 percent slopes, in an area of Kobeh-Shipley association, about 14 miles west of Eureka, about 280 feet south and 660 feet east of the northwest corner of sec. 11, T. 18 N., R. 51 E.

A—0 to 7 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few medium roots and common fine and very fine roots; common fine and very fine interstitial pores; 25 percent pebbles; neutral (pH 7.0); clear smooth boundary. (5 to 8 inches thick)

Bw—7 to 15 inches; pale brown (10YR 6/3) gravelly fine sandy loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few medium roots and common fine and very fine roots; common fine and very fine interstitial pores; 30 percent pebbles; neutral (pH 7.0); clear wavy boundary. (6 to 10 inches thick)

2Bqk—15 to 32 inches; very pale brown (10YR 7/3) very gravelly sandy loam, brown (10YR 5/3) moist; massive; hard, firm, nonsticky and nonplastic; few fine and very fine roots; few fine and very fine interstitial pores; discontinuous thin weakly cemented laminae; 20 percent brittle durinodes; 50 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (10 to 20 inches thick)

2Bk—32 to 52 inches; very pale brown (10YR 7/3) very gravelly sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 45 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (15 to 28 inches thick)

3Bk—52 to 60 inches; light gray (10YR 7/2) gravelly fine sandy loam, brown (10YR 5/3) moist; massive; hard, friable, nonsticky and nonplastic; few medium roots; common fine and very fine interstitial pores; 30 percent pebbles; violently effervescent; strongly alkaline (pH 9.0).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 44 to 47 degrees F. Depth to the Bqk horizon ranges from 12 to 18 inches. The upper part of the particle-size control section is gravelly sandy loam or gravelly fine sandy loam with 20 to 30 percent rock fragments and 5 to 15 percent clay. The lower part is very gravelly sandy loam to very gravelly sand with 45 to 60 percent rock fragments. The particle-size control section averages 35 to 60 percent rock fragments. Reaction is slightly acid or neutral in the A and Bw horizons and is neutral to strongly alkaline below.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist. It is massive or has platy or subangular blocky structure.

The Bw horizon has value of 5 or 6 when dry and 3 to 5 when moist, and it has chroma of 2 or 3.

The Bqk, 2Bk, and 3Bk horizons have value of 6 or 7 when dry and 4 or 5 when moist, and they have chroma of 2 or 3. One or more of these horizons contains either 20 to 70 percent durinodes or continuous weakly silica-cemented lenses, or both.

Kodra Series

The Kodra series consists of moderately deep, well drained, moderately permeable soils on fan piedmont remnants. These soils formed in alluvium derived from basalt, rhyolite, and siliceous rock with some influence of volcanic ash. Slope is 0 to 8 percent. Elevation is 5,100 to 6,200 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 90 to 100 days.

Typical pedon of a Kodra loam, 0 to 4 percent slopes, about 13 miles south and 20 miles east of Crescent Valley; 2,110 feet south and 1,050 feet west of the northeast corner of sec. 15, T. 27 N., R. 51 E.

A—0 to 5 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; strong very thin and thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine vesicular pores; moderately alkaline (pH 8.2); abrupt smooth boundary. (3 to 5 inches thick)

Bw1—5 to 10 inches; light gray (10YR 7/2) loam, brown (10YR 4/3) moist; moderate coarse prismatic structure; hard, very friable, slightly sticky and plastic; many very fine and fine roots; many very fine and fine tubular pores; moderately alkaline (pH 8.4); abrupt wavy boundary. (3 to 6 inches thick)

Bw2—10 to 14 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular pores; strongly alkaline (pH 8.8); clear wavy boundary. (3 to 5 inches thick)

Bqk1—14 to 17 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine

tubular pores; common fine lime filaments; 40 percent strong durinodes; strongly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (2 to 4 inches thick)

Bqk2—17 to 28 inches; light gray (10YR 7/2) sandy loam, brown (10YR 5/3) moist; massive; hard, firm, nonsticky and slightly plastic; few very fine roots; common very fine tubular pores; common fine lime filaments; continuous weak silica cementation; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (9 to 12 inches thick)

Bqkm—28 to 48 inches; very pale brown (10YR 7/3) strongly cemented duripan, brown (10YR 4/3) moist; moderate thick platy structure; very hard, very firm; few very fine roots between hardpan plates; few very fine tubular pores; common fine gypsum filaments; violently effervescent; moderately alkaline (pH 8.4); abrupt irregular boundary. (16 to 21 inches thick)

2Cq—48 to 60 inches; very pale brown (10YR 7/3) sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; 1- to 5-inch-thick lenses of discontinuous weak silica cementation; slightly effervescent; moderately alkaline (pH 8.4).

These soils are usually dry; they are moist in winter and spring and dry in June to October. The mean annual soil temperature is 49 to 51 degrees F. Depth to the strongly cemented duripan ranges from 20 to 30 inches.

The Bw horizon is loam or sandy loam with as much as 15 percent pebbles. Reaction is moderately alkaline or strongly alkaline.

The Bqk horizon commonly contains stratified silt loam to sand with as much as 15 percent pebbles.

Kodra Variant

The Kodra Variant consists of shallow, well drained, moderately slowly permeable soils on hill crests and upper side slopes. These soils formed in residuum derived from chert, quartzite, and tuffaceous sandstone. Slope is 15 to 30 percent. Elevation is 4,800 to 6,000 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Kodra Variant gravelly loam, 15 to 30 percent slopes, in an area of Soughe-Fortank-Kodra Variant association, about 1 mile south and 5 miles east of Crescent Valley, about 1,600 feet south and 1,000 feet east of the northwest corner of sec. 6, T. 29 N., R. 49 E.

A—0 to 6 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak very thin and thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; common very fine vesicular and interstitial pores; 20 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (3 to 6 inches thick)

C1—6 to 12 inches; pale brown (10YR 6/3) gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few very fine vesicular pores; 15 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (4 to 8 inches thick)

C2—12 to 18 inches; pale brown (10YR 6/3) gravelly loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, sticky and slightly plastic; common very fine and fine roots; few very fine vesicular pores; 20 percent pebbles; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (4 to 7 inches thick)

Cqkm—18 to 19 inches; continuous indurated silica laminae 1/16 to 1 inch thick.

R—19 inches; tuffaceous sandstone.

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is about 47 to 50 degrees F. Depth to the indurated duripan ranges from 12 to 19 inches. Depth to bedrock is 14 to 20 inches. Effervescent ranges from strong to violent. The profile contains 15 to 25 percent pebbles. Reaction is moderately alkaline or strongly alkaline.

The A horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 3 or 4.

The C horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 3 or 4.

These soils are a variant of the Kodra series because of the depth to bedrock and presence of an indurated duripan.

Labshaft Series

The Labshaft series consists of shallow, well drained, moderately slowly permeable soils on side slopes of mountains. These soils formed in residuum derived from siliceous rock. Slope is 15 to 50 percent. Elevation is 7,500 to 10,000 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is about 50 days.

Typical pedon of a Labshaft very stony loam, 15 to 50 percent slopes, in an area of Labshaft-Winu association, about 8 miles southwest of Eureka, about 2,600 feet east and 1,000 feet north of the southwest corner of sec. 24, T. 18 N., R. 52 E.

About 15 percent of the surface is covered with stones.

A—0 to 5 inches; brown (10YR 5/3) very stony loam, dark brown (10YR 3/3) moist; weak very fine granular structure; soft, very friable, slightly sticky

and slightly plastic; many fine and very fine roots; many very fine interstitial pores; 25 percent pebbles; neutral (pH 7.0); clear smooth boundary. (4 to 6 inches thick)

Bw—5 to 11 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine angular blocky structure; slightly hard, friable, sticky and plastic; common fine and very fine roots; many very fine interstitial pores; 40 percent pebbles, 5 percent cobbles, and 5 percent stones; neutral (pH 7.0); abrupt wavy boundary. (6 to 14 inches thick)

R—11 inches; quartzite.

These soils are moist in winter and spring; they are dry in mid-July to early October. The mean annual soil temperature is 43 to 47 degrees F, and the mean summer soil temperature is 54 to 59 degrees. Depth to bedrock is 10 to 20 inches. The soils are neutral or slightly acid. The mollic epipedon is 7 to 14 inches thick and commonly includes part or all of the Bw horizon.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3.

The Bw horizon has value of 5 or 6 when dry and 2 or 3 when moist, and it has chroma of 2 to 4. Texture is loam, clay loam, or sandy clay loam that is 25 to 35 percent clay modified with 40 to 70 percent angular rock fragments, mostly pebbles.

Lien Series

The Lien series consists of well drained, moderately rapidly permeable soils that are shallow to a duripan. These soils are on ballenas. They formed in alluvium derived from various kinds of rock with some influence of loess and volcanic ash. Slope is 4 to 15 percent. Elevation is 6,400 to 7,100 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Lien very gravelly loam, 4 to 15 percent slopes, in an area of Lien-Hayeston association, about 13 miles south of Eureka, about 2,300 feet north and 500 feet west of the southeast corner of sec. 23, T. 17 N., R. 53 E.

A1—0 to 2 inches; light brownish gray (10YR 6/2) very gravelly loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and slightly plastic; common medium and fine vesicular pores; 40 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 3 inches thick)

A2—2 to 4 inches; light brownish gray (10YR 6/2) very gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and slightly plastic; few fine roots; common fine and very fine interstitial pores; 40 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 3 inches thick)

C—4 to 8 inches; light yellowish brown (10YR 6/4) extremely gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and slightly plastic; common medium, fine, and very fine roots; common fine and very fine interstitial pores; 70 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (3 to 8 inches thick)

Cqkm—8 to 22 inches; white (10YR 8/2) indurated duripan, light gray (10YR 7/2) moist; massive; extremely hard, extremely firm; common fine and very fine roots matted on surfaces of indurated layers; few fine interstitial pores; violently effervescent; moderately alkaline (pH 8.4).

These soils are usually dry; they are moist in winter and spring but are dry in mid-June to October. The mean annual soil temperature is 44 to 47 degrees F. The depth to the duripan is 7 to 14 inches.

The A and C horizons have value of 3 or 4 when moist, and they have chroma of 2 to 4. They have subangular blocky structure or are massive. Reaction is moderately alkaline to very strongly alkaline. These horizons are sandy loam, fine sandy loam, or loam modified with 50 to 70 percent pebbles. The pebbles are mainly pan fragments.

Loncan Series

The Loncan series consists of moderately deep, well drained, moderately permeable soils on side slopes of mountains. These soils formed in residuum and colluvium derived from sedimentary and volcanic rock. Slope is 15 to 50 percent. Elevation is 6,500 to 9,000 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 42 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Loncan gravelly loam, 15 to 50 percent slopes, in an area of Loncan-Gando-Glean association, about 39 miles northwest of Eureka, about 300 feet west and 1,900 feet south of the northeast corner of sec. 32, T. 24 N., R. 49 E.

A1—0 to 10 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; strong thin platy structure; soft, friable, nonsticky and nonplastic; many fine and very fine roots; many fine and very fine interstitial pores; 25 percent pebbles; neutral (pH 7.2); clear smooth boundary. (10 to 14 inches thick)

A2—10 to 14 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; many fine and very fine roots; many fine and very fine interstitial

pores; 35 percent pebbles; neutral (pH 7.3); clear smooth boundary. (0 to 4 inches thick)

AC—14 to 29 inches; brown (10YR 5/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, nonsticky and slightly plastic; common fine and very fine roots; many fine and very fine interstitial pores; 50 percent pebbles; neutral (pH 7.2); clear wavy boundary. (Il to 15 inches thick)

2C—29 to 35 inches; pale brown (10YR 6/3) very gravelly sandy clay loam, brown (10YR 5/3) moist; massive; hard, friable, sticky and plastic; common fine and very fine roots; common fine and very fine interstitial pores; 45 percent angular pebbles and 10 percent angular cobbles; neutral (pH 7.2); abrupt irregular boundary. (0 to 6 inches thick)

R—35 to 42 inches; fractured chert.

These soils are usually dry; they are moist in winter and spring but are dry late in June to mid-October. The mean annual soil temperature is 42 to 46 degrees F. The average texture of the particle-size control section is loam that is 18 to 27 percent clay. Rock fragment content ranges from 50 to 70 percent; cobble content is as much as 30 percent in some of the lower horizons. The mollic epipedon is 10 to 14 inches thick and is neutral. Depth to bedrock is 21 to 38 inches.

The A horizon has value of 4 or 5 when dry, and it has chroma of 2 or 3. It has platy, subangular blocky, or granular structure.

The 2C horizon has value of 5 or 6 when dry and 3 or 4 when moist. It is loam or sandy clay loam in the fine earth fraction.

Loncan Variant

The Loncan Variant consists of very deep, well drained, moderately slowly permeable soils on inset fans. These soils formed in alluvium derived from various kinds of rock with some influence of loess and volcanic ash. Slope is 0 to 2 percent. Elevation is 5,100 to 5,300 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 49 degrees F. The frost-free season is 90 to 100 days.

Typical pedon of a Loncan Variant loam, about 23 miles south of Carlin, about 1,050 feet east of the northwest corner of sec. 3, T. 29 N., R. 52 E.

A1—0 to 2 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; moderate thin platy structure; soft, very friable, nonsticky and slightly plastic; few medium roots and many fine and very fine roots; common fine vesicular pores; moderately alkaline (pH 8.2); clear smooth boundary. (1 to 2 inches thick)

A2—2 to 5 inches; brown (10YR 5/3) silt loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; few medium roots and many fine and very fine roots; common fine vesicular pores; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 3 inches thick)

A3—5 to 11 inches; brown (10YR 5/3) silt loam, very dark grayish brown (10YR 3/2) moist; moderate coarse and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium roots and common fine and very fine roots; common fine and many very fine tubular pores; moderately alkaline (pH 8.4); clear wavy boundary. (5 to 6 inches thick)

Ag—11 to 19 inches; brown (10YR 5/3) silt loam, very dark grayish brown (10YR 3/2) moist; strong medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium roots and common fine and very fine roots; few medium roots and many fine and very fine tubular pores; 10 percent brittle durinodes; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 8 inches thick)

2Bq—19 to 38 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; strong medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; few medium roots and many fine and very fine tubular pores; continuous weak silica cementation; 15 percent pebbles; strongly alkaline (pH 8.6); gradual wavy boundary. (17 to 21 inches thick)

2Bqk—38 to 48 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine roots; common fine and very fine tubular pores; continuous weak silica and lime cementation; common fine lime filaments; strongly effervescent; 25 percent pebbles; strongly alkaline (pH 8.6); clear wavy boundary. (9 to 11 inches thick)

3Bk—48 to 60 inches; pale brown (10YR 6/3) very gravelly loamy sand, dark brown (10YR 3/3) moist; single grain; loose; few very fine roots; many fine interstitial pores; strongly effervescent; thin lime coatings on the underside of pebbles; 50 percent pebbles; strongly alkaline (pH 8.8).

These soils are moist in winter and spring; they are dry in mid-June to October. The mean annual soil temperature is 47 to 49 degrees F. Thickness of the mollic epipedon and depth to continuous weak silica cementation are 14 to 19 inches.

The Bq horizon has 15 to 35 percent pebbles, commonly increasing with increasing depth.

These soils are a variant of the Loncan series because they average less than 35 percent rock fragments between depths of 10 and 40 inches, the mean annual soil temperature is more than 47 degrees F, and they have silica and lime cementation.

Lopwash Series

The Lopwash series consists of very deep, well drained, moderately rapidly permeable soils on fan skirts. These soils formed in alluvium derived from various kinds of rock. Slope is 0 to 4 percent. Elevation is 6,200 to 6,800 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of Lopwash loam, 0 to 4 percent slopes, about 26 miles southwest of Eureka at the approximate center of sec. 4, T. 16 N., R. 50 E.

A—0 to 4 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; weak medium platy structure; slightly hard, friable, nonsticky and nonplastic; few medium and fine roots; many fine and very fine vesicular pores; 10 percent pebbles; strongly alkaline (pH 8.6); abrupt smooth boundary. (4 to 9 inches thick)

Bw—4 to 10 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium, fine, and very fine roots; common fine and very fine interstitial pores; 20 percent pebbles; strongly alkaline (pH 8.8); clear smooth boundary. (5 to 7 inches thick)

C—10 to 18 inches; light yellowish brown (10YR 6/4) very gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few medium roots and common fine and very fine roots; common fine and very fine interstitial pores; 55 percent pebbles; strongly alkaline (pH 8.8); clear smooth boundary. (7 to 14 inches thick)

Ck1—18 to 32 inches; light yellowish brown (10YR 6/4) very gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 55 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (14 to 42 inches thick)

Ck2—32 to 60 inches; light yellowish brown (10YR 6/4) very gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 50 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6).

These soils are usually dry; they are moist in winter and early in spring and dry late in May to October. The mean annual soil temperature is 45 to 47 degrees F. The thickness of the A and Bw horizons ranges from 10 to 16 inches. Where mixed, the particle-size control section averages 35 to 70 percent rock fragments and is 5 to 18 percent clay. Depth to carbonates ranges from 14 to 20 inches.

The A horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3. It is moderately alkaline or strongly alkaline.

The Bw horizon has value of 5 or 6 when dry and 4 or 5 when moist, and it has chroma of 3 or 4. It is sandy loam, gravelly sandy loam, loam, or gravelly loam. It is moderately alkaline or strongly alkaline.

The C horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 4 to 6. It commonly is coarse sandy loam, but in some pedons it is loamy sand or sand in the lower part. It is 35 to 70 percent pebbles. Reaction is moderately alkaline or strongly alkaline.

Maghills Series

The Maghills series consists of very deep, well drained, moderately permeable soils on alluvial fans and fan skirts. These soils formed in alluvium weathered from limestone with some influence of volcanic ash. Slope is 2 to 8 percent. Elevation is 6,000 to 7,000 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Maghills gravelly sandy loam, 2 to 8 percent slopes, in an area of Nuc-Maghills association, about 14 miles west of Eureka, about 1,700 feet north and 700 feet east of the southwest corner of sec. 2, T. 18 N., R. 51 E.

A1—0 to 4 inches; light brownish gray (10YR 6/2) gravelly sandy loam, grayish brown (10YR 5/2) moist; moderate thick and medium platy structure; slightly hard, friable, nonsticky and nonplastic; few medium roots and common fine and very fine roots; common fine vesicular pores; 25 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 4 inches thick)

A2—4 to 8 inches; light brownish gray (10YR 6/2) gravelly sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few medium roots and common fine and very fine roots; common fine and very fine interstitial pores; 15 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (2 to 4 inches thick)

C—8 to 17 inches; pale brown (10YR 6/3) gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; moderate medium and fine subangular blocky structure; soft, friable, nonsticky and nonplastic; few medium roots and common fine and very fine roots; common fine and very fine interstitial pores; 25 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (6 to 10 inches thick)

2C1—17 to 3l inches; very pale brown (10YR 7/3) very gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, friable, nonsticky and nonplastic; many fine and very fine roots; common fine and very fine interstitial pores; 45 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (5 to 14 inches thick)

2C2—31 to 44 inches; very pale brown (10YR 7/3) very gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 55 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); gradual wavy boundary. (7 to 15 inches thick)

2Cqk—44 to 60 inches; very pale brown (10YR 7/3) extremely gravelly loamy sand, yellowish brown (10YR 5/4) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; common fine and very fine interstitial pores; discontinuous weak silica cementation; 70 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature ranges from 45 to 47 degrees F. Where mixed, the particle-size control section averages 35 to 60 percent rock fragments, mainly pebbles; 10 to 18 percent clay; and 40 to 60 percent calcium carbonate equivalent. Depth to the 2C horizon is 10 to 18 inches. Depth to the 2Cqk horizon is 40 inches to more than 60 inches. The profile is strongly effervescent or violently effervescent throughout.

The A horizon has value of 6 or 7 when dry and 3 to 5 when moist, and it has chroma of 2 or 3. Reaction is moderately alkaline or strongly alkaline.

The C horizon is sandy loam, fine sandy loam, silt loam, or loam modified with 25 to 50 percent rock fragments. Reaction is moderately alkaline or strongly alkaline.

The 2C horizon has value of 6 or 7 when dry and 4 to 6 when moist, and it has chroma of 3 or 4. It is loamy sand, fine sandy loam, or sandy loam modified with 45 to 70 percent rock fragments. Reaction is moderately alkaline to very strongly alkaline.

The 2Cqk horizon is extremely gravelly loamy sand or extremely gravelly sand with 60 to 70 percent rock fragments.

Mau Series

The Mau series consists of moderately deep, well drained, slowly permeable soils on side slopes of mountains and low hill remnants. These soils formed in residuum and colluvium derived from andesite and basalt. Slope is 15 to 30 percent. Elevation is 6,200 to 7,800 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Mau stony loam, 15 to 30 percent slopes, in an area of Mau-Shagnasty-Eightmile association, about 25 miles south of Crescent Valley, about 500 feet south and 500 feet east of the northwest corner of sec. 35, T. 26 N., R. 48 E.

From 1 to 3 percent of the surface is covered with stones.

A—0 to 4 inches; grayish brown (10YR 6/2) stony loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; soft, friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 15 percent pebbles; neutral (pH 7.0); clear smooth boundary. (4 to 6 inches thick)

Bt1—4 to 10 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine angular blocky structure; slightly hard, friable, sticky and plastic; common fine and very fine roots; common fine and very fine tubular pores; common thin clay films lining pores and on ped faces; 40 percent pebbles; neutral (pH 7.0); gradual smooth boundary. (4 to 8 inches thick)

Bt2—10 to 24 inches; yellowish brown (10YR 5/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium and fine angular blocky structure; hard, firm, sticky and plastic; common fine and very fine tubular pores; common moderately thick pressure faces on peds; 40 percent pebbles and 5 percent cobbles; neutral (pH 7.3); gradual wavy boundary. (8 to 15 inches thick)

Bqk—24 to 34 inches; very pale brown (10YR 7/3) very gravelly clay, pale brown (10YR 6/3) moist; massive; hard, firm, sticky and plastic; few fine roots; few medium and fine tubular pores; common moderately thick pressure faces on peds; discontinuous weak silica and lime cementation; 40 percent pebbles and 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); clear irregular boundary. (6 to 11 inches thick)

R—34 inches; andesite.

These soils are usually dry; they are moist in winter and spring but are dry late in June to October. The mean annual soil temperature is 45 to 47 degrees F. Depth to the base of the argillic horizon is 16 to 32 inches, and depth to bedrock is 20 to 40 inches. The argillic horizon is 35 to 45 percent clay and 45 to 60 percent rock fragments. The A and Bt horizons are neutral or slightly acid.

The A horizon has value of 5 or 6 when dry and 2 or 3 when moist, and it has chroma of 1 or 2.

The Bt horizon has value of 4 or 5 when dry and 3 to 5 when moist, and it has chroma of 3 or 4. It is very gravelly clay or very gravelly clay loam.

The Bqk horizon has value of 7 or 8 when dry and 6 or 7 when moist, and it has chroma of 2 or 3. It is very gravelly clay or extremely gravelly clay loam. It is slightly effervescent to violently effervescent and is moderately alkaline or strongly alkaline.

The R horizon has discontinuous lime and silica coatings on the surface and in the fractures.

McConnel Series

The McConnel series consists of very deep, somewhat excessively drained, moderately rapidly permeable soils on offshore bars and fan skirts. These soils formed in loamy alluvium with some influence of loess overlying lake beach sediment. Slope is 0 to 4 percent. Elevation is 4,700 to 5,500 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a McConnel loam, 2 to 4 percent slopes, in an area of Enko-Davey-McConnel association, about 12 miles south and 11 miles east of Crescent Valley, about 800 feet north and 150 feet east of the southwest corner of sec. 8, T. 28 N., R. 49 E.

A1—0 to 2 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine vesicular and tubular pores; 5 percent pebbles; mildly alkaline (pH 7.4); abrupt wavy boundary. (2 to 5 inches thick)

A2—2 to 6 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate very thin and thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine vesicular and tubular pores; 10 percent pebbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (4 to 6 inches thick)

Bw—6 to 13 inches; very pale brown (10YR 7/3) loam, dark yellowish brown (10YR 4/4) moist; massive; hard, very friable, slightly sticky and slightly plastic; common very fine and medium roots; many very fine and fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.2); clear wavy boundary. (5 to 8 inches thick)

2Bk—13 to 17 inches; very pale brown (10YR 7/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; lime coatings on the underside of pebbles; 60 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (3 to 7 inches thick)

3Bk1—17 to 22 inches; very pale brown (10YR 7/3) very gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; common fine tubular pores; 60 percent pebbles; lime coatings on the underside of pebbles; strongly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (4 to 7 inches thick)

3Bk2—22 to 62 inches; variegated very gravelly coarse sand; single grain; loose, nonsticky and nonplastic; few very fine roots; lime coatings on the underside of pebbles and cobbles; 15 percent cobbles and 50 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 50 to 52 degrees F. Depth to the unconformable very gravelly material and carbonates ranges from 12 to 18 inches. Where mixed, the particle-size control section has 60 to 80 percent pebbles and cobbles; it is sandy loam in the upper part and stratified very gravelly coarse sand to extremely gravelly loamy sand in the lower part. The A and Bw horizons are neutral to moderately alkaline and the Bk horizon is moderately alkaline to very strongly alkaline.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. It has platy or granular structure.

The Bw horizon has value of 6 or 7 when dry and 4 or 5 when moist. It is loam, sandy loam, or fine sandy loam.

The Bk horizon has value of 6 or 7 when dry and 4 or 5 when moist.

Molion Series

The Molion series consists of well drained, moderately permeable soils that are shallow to a duripan. These soils are on fan piedmonts. They formed in alluvium derived from various kinds of rock with some influence of loess. Slope is 0 to 8 percent. Elevation is 6,000 to 6,800 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Molion loam, 0 to 2 percent slopes, in an area of Molion-Kobeh association, about 15 miles west of Eureka, about 600 feet south and 1,300 feet west of the northeast corner of sec. 20, T. 19 N., R. 51 E.

A1—0 to 2 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; weak medium platy structure; soft, friable, slightly sticky and slightly plastic; few fine roots; many very fine interstitial and tubular pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (1 to 2 inches thick)

A2—2 to 5 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; many

very fine interstitial pores and common very fine tubular pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 3 inches thick)

Bk1—5 to 11 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common medium and fine roots; many very fine interstitial pores and common very fine tubular pores; 15 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (4 to 7 inches thick)

Bk2—11 to 19 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, friable, nonsticky and nonplastic; common fine and very fine roots; common fine interstitial and tubular pores; 70 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (6 to 8 inches thick)

Bqkm—19 to 33 inches; light brownish gray (10YR 7/2) strongly cemented duripan, pale brown (10YR 6/3) moist; massive; extremely hard, extremely firm; few fine tubular pores; 70 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); gradual wavy boundary. (8 to 14 inches thick)

2C1—33 to 39 inches; pale brown (10YR 6/3) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; many very fine interstitial pores; 40 percent gravel; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (6 to 12 inches thick)

2C2—39 to 60 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; massive; hard, firm, slightly sticky and slightly plastic; many very fine interstitial pores; 70 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 45 to 47 degrees F. Depth to the strongly cemented duripan ranges from 14 to 20 inches.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3.

The Bk horizon has value of 5 or 6 when dry, and it has chroma of 2 to 4. It ranges from very gravelly sandy loam to extremely gravelly loam.

The 2C horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 to 4. It ranges from very gravelly loamy sand to extremely gravelly loam.

Mosquet Series

The Mosquet series consists of shallow and very shallow, well drained, slowly permeable soils on side slopes of mountains. These soils formed in residuum derived from basalt, andesite, and rhyolite with minor admixtures of volcanic ash. Slope is 30 to 50 percent. Elevation is 7,800 to 9,500 feet. The mean annual precipitation is about 16 inches, and the mean annual temperature is about 41 degrees F. The frost-free season is 50 to 70 days.

Typical pedon of a Mosquet very stony loam, 30 to 50 percent slopes, in an area of Winu-Mosquet association, about 26 miles northwest of Eureka, about 1,100 feet south and 700 feet east of the northwest corner of sec. 32, T. 23 N., R. 51 E.

About 10 percent of the surface is covered with stones.

A—0 to 11 inches; brown (10YR 4/3) very stony loam, dark brown (10YR 3/3) moist; moderate very fine granular structure; soft, friable, slightly sticky and slightly plastic; many fine and very fine roots; many very fine interstitial and tubular pores; 20 percent pebbles and 5 percent cobbles; neutral (pH 6.8); clear smooth boundary. (6 to 12 inches thick)

Bt1—11 to 14 inches; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 3/3) moist; moderate fine and very fine subangular blocky structure; hard, firm, sticky and plastic; many fine and very fine roots; many very fine interstitial and tubular pores; few thin clay films lining pores and on ped faces; 20 percent pebbles and 5 percent cobbles; neutral (pH 7.0); abrupt wavy boundary. (0 to 4 inches thick)

Bt2—14 to 18 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium and fine angular blocky structure; very hard, very firm, sticky and plastic; common fine and very fine roots; common very fine tubular pores; common thin and few moderately thick pressure faces on peds; 20 percent pebbles and 5 percent cobbles; neutral (pH 6.8); abrupt broken boundary. (0 to 4 inches thick)

R—18 inches; andesite.

These soils are moist in winter and spring but are dry in July to September. The mean annual soil temperature ranges from 56 to 59 degrees F. Depth to bedrock is 6 to 20 inches. The cracks and fractures in bedrock contain soil material. The mollic epipedon is 6 to 14 inches thick and includes all or part of the argillic horizon. The argillic horizon is clay loam, sandy clay, or clay; it is 35 to 50 percent clay modified with as much as 35 percent coarse fragments.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3. It has granular or subangular blocky structure.

The Bt horizon has hue of 10YR or 7.5YR, and it has value of 4 or 5 when dry and 3 or 4 when moist. It has subangular blocky or angular blocky structure.

The upper 2 inches of the R horizon is weakly weathered to strongly weathered in some pedons.

Nadra Series

The Nadra series consists of well drained, moderately permeable soils that are shallow to a duripan. These soils are on fan piedmonts. They formed in alluvium derived from mixed sources with some influence of loess. Slope is 0 to 4 percent. Elevation is 6,000 to 7,000 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of Nadra loam, 0 to 4 percent slopes, about 15 miles southwest of Eureka, about 1,800 feet south and 1,500 feet east of the northwest corner of sec. 3, T. 17 N., R. 51 E.

A1—0 to 2 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; moderate thick platy structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine vesicular and interstitial pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 6 inches thick)

A2—2 to 7 inches; light brownish gray (10YR 6/2) loam, brown (10YR 4/3) moist; weak thin platy structure; soft, friable, slightly sticky and slightly plastic; many medium and fine roots; common fine and very fine interstitial and tubular pores; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 6 inches thick)

Bw—7 to 13 inches; pale brown (10YR 6/3) gravelly loam, yellowish brown (10YR 5/4) moist; weak medium and fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many medium and fine roots; common fine and very fine interstitial and tubular pores; 15 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (5 to 8 inches thick)

Bqk—13 to 19 inches; very pale brown (10YR 7/3) gravelly loam, light yellowish brown (10YR 6/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few fine and very fine roots; few fine and very fine interstitial and tubular pores; weak silica and lime cementation; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (0 to 6 inches thick)

Bqkm—19 to 33 inches; white (10YR 8/1) duripan with many very thin continuous strongly silica-cemented laminae, very pale brown (10YR 8/3) moist; massive; very hard, very firm; few fine and very fine roots in cracks; many fine roots matted on laminae in upper part; few very fine interstitial pores; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (6 to 17 inches thick)

2Ck—33 to 60 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, light yellowish brown (10YR 6/4) moist; massive; hard, firm, nonsticky and nonplastic; very few very fine roots; many fine and very fine interstitial pores; thick lime coatings on pebbles; 70 percent pebbles; violently effervescent; very strongly alkaline (pH 9.2).

These soils are usually dry; they are moist in winter and early in spring but are dry in June to October. The mean annual soil temperature is 45 to 47 degrees F. The thickness of the A and Bw horizons is 9 to 20 inches. Depth to the strongly cemented duripan is 14 to 20 inches. The A and B horizons are moderately alkaline or strongly alkaline.

The A horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3.

The Bw horizon has value of 6 when dry and 4 or 5 when moist, and it has chroma of 3 or 4. It is sandy loam, gravelly sandy loam, loam, or gravelly loam. It has weak or moderate, fine or medium, subangular blocky structure.

The Bqk horizon has value of 6 to 8 when dry and 5 to 7 when moist, and it has chroma of 3 or 4. It is fine sandy loam, loam, or gravelly loam.

Needle Peak Series

The Needle Peak series consists of very deep, somewhat poorly drained, moderately slowly permeable soils on flood plains. These soils formed in mixed silty alluvium. Slope is 0 to 2 percent. Elevation is 4,700 to 4,800 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Needle Peak silt loam, occasionally flooded, about 15 miles south of Crescent Valley; about 2,600 feet east of the northwest corner of sec. 20, T. 28 N., R. 48 E.

A1—0 to 4 inches; light brownish gray (10YR 6/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure; slightly hard, friable, slightly sticky and plastic; many fine and medium roots; many very fine interstitial pores; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (3 to 5 inches thick)

A2—4 to 7 inches; pale brown (10YR 6/3) silty clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; hard, friable, sticky and plastic; many fine and very fine roots and common medium roots; many fine and very fine tubular pores; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (1 to 3 inches thick)

A3—7 to 12 inches; pale brown (10YR 6/3) silty clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; hard, friable, sticky and plastic; many fine and medium roots; common fine tubular pores; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (0 to 5 inches thick)

C—12 to 20 inches; pale brown (10YR 6/3) silty clay loam, dark grayish brown (10YR 4/2) moist; weak very fine subangular blocky structure; hard, friable, sticky and plastic; common fine and medium roots; common fine tubular pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (6 to 9 inches thick)

Ck1—20 to 40 inches; pale brown (10YR 6/3) silt loam, dark grayish brown (10YR 4/2) moist; common medium distinct yellowish brown (10YR 5/6, dry) iron mottles; common fine distinct very dark gray (10YR 3/1, moist) mottles below a depth of 30 inches; massive; hard, friable, slightly sticky and plastic; common very fine and fine roots; few very fine tubular pores; few fine lime filaments; violently effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (8 to 20 inches thick)

Ck2—40 to 60 inches; light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; few fine distinct yellowish brown (10YR 5/6) iron mottles, very dark gray (10YR 3/1) moist; massive; hard, friable, sticky and plastic; few fine and very fine roots; few very fine tubular pores; few fine lime filaments; violently effervescent; strongly alkaline (pH 8.8).

These soils have a seasonal high water table at a depth of 4 to 6 feet for 1 month or more during winter and spring. The mean annual soil temperature is 49 to 52 degrees F. Depth to lime is 0 to 10 inches. The particle-size control section is silt loam or silty clay loam that averages 25 to 35 percent clay. The profile is mildly alkaline to strongly alkaline in the A horizon, and it is moderately alkaline or strongly alkaline below.

The A horizon has value of 3 or 4 when moist, and it has chroma of 2 or 3. It has platy or subangular blocky structure.

The C horizon has chroma of 2 or 3. It has iron mottles at a depth of 20 inches or more. It is massive or has subangular blocky structure.

Nevador Series

The Nevador series consists of very deep, well drained, moderately slowly permeable soils on fan piedmonts. These soils formed in alluvium derived mainly from volcanic rock with a component of loess and volcanic ash. Slope is 0 to 8 percent. Elevation is 5,000 to 6,000 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 46 degrees F. The frost-free season is 100 to 200 days.

Typical pedon of a Nevador very fine sandy loam, 0 to 4 percent slopes, in an area of Ricert-Nevador association, about 23 miles south and 13 miles east of Crescent Valley, about 1,300 feet west and 1,300 feet south of the northeast corner of sec. 28, T. 26 N., R. 50 E.

A—0 to 5 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and nonplastic; few fine and very fine roots; common fine and very fine vesicular and tubular pores; 5 percent pebbles; mildly alkaline (pH. 7.8); abrupt smooth boundary. (4 to 6 inches thick)

Bt—5 to 14 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, sticky and plastic; common medium roots and few fine and very fine roots; common medium and fine tubular pores; common moderately thick clay films lining pores and on ped faces; 5 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (7 to 9 inches thick)

Bk—14 to 22 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak medium and fine subangular blocky structure; hard, firm, nonsticky and nonplastic; common medium roots and few fine and very fine roots; common medium and fine tubular pores; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); gradual smooth boundary. (0 to 10 inches thick)

2Bqk—22 to 39 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; massive; hard, friable, nonsticky and nonplastic; few fine and very fine roots; common fine tubular pores; 25 percent hard, firm, and brittle durinodes; 15 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); gradual smooth boundary. (8 to 20 inches thick)

2Bk—39 to 60 inches; brownish gray (10YR 6/2) gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; common medium and fine interstitial pores; 15 percent pebbles; violently effervescent; moderately alkaline (pH 8.2).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature ranges from 47 to 49 degrees F. Depth to carbonates ranges from 12 to 24 inches. Where mixed, the argillic horizon is 25 to 35 percent clay and 5 to 15 percent pebbles. The profile is noneffervescent in the A and Bt horizons, and it is strongly effervescent or violently effervescent below.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. It has platy or granular structure.

The Bt horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 3 or 4. It is sandy clay loam, clay loam, or loam. It has subangular blocky, angular blocky, or prismatic structure.

The Bqk horizon has 20 to 45 percent durinodes in the matrix.

The 2B horizon has value of 5 or 6 when dry and 4 or 5 when moist, and it has chroma of 2 or 3. It is stratified

gravelly fine sandy loam to loamy sand modified with 5 to 20 percent pebbles.

Nuc Series

The Nuc series consists of very deep, somewhat excessively drained, slowly permeable soils on alluvial fans and fan skirts. These soils formed in alluvium derived from limestone. Slope is 4 to 8 percent. Elevation is 6,000 to 7,000 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Nuc gravelly loam, 4 to 8 percent slopes, in an area of Nuc-Maghills association, about 13 miles west of Eureka, about 1,300 feet east of 1,800 feet north of the southwest corner of sec. 2, T. 18 N., R. 51 E.

A—0 to 4 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak medium platy structure; slightly hard, friable, nonsticky and nonplastic; few medium and fine roots; common fine vesicular pores; 30 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (3 to 5 inches thick)

Bw—4 to 13 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few medium, fine, and very fine roots; few fine and very fine interstitial pores; 35 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (8 to 12 inches thick)

Bk—13 to 29 inches; very pale brown (10YR 7/3) very gravelly loam, brown (10YR 5/3) moist; massive; hard, firm, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 20 percent thin discontinuous weakly lime-cemented laminae; 55 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (10 to 17 inches thick)

Bkq—29 to 44 inches; very pale brown (10YR 7/3) very gravelly loam, brown (10YR 5/3) moist; massive; hard, firm, nonsticky and nonplastic; few fine and very fine roots; few fine and very fine interstitial pores; 20 percent thin weakly cemented lime and silica laminae; 50 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (10 to 18 inches thick)

2Bkq—44 to 60 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; common fine and very fine interstitial pores; few thin weakly cemented lime and silica laminae; 70 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 45 to 47 degrees F. Where mixed, the particle-size control section averages loam or clay loam; it is 15 to 30 percent clay modified with 50 to 75 percent rock fragments, mainly pebbles. It has 40 to 70 percent calcium carbonate equivalent. Depth to the discontinuous, weakly cemented calcic horizon is 11 to 16 inches.

The A horizon has hue of 10YR or 2.5Y, and it has value of 6 or 7 when dry and 4 or 5 when moist.

The calcic horizon is slightly hard, hard, or very hard and is cemented mainly with carbonates and accessory silica in one or more of the layers.

Ocala Series

The Ocala series consists of very deep, somewhat poorly drained, slowly permeable soils on low-lying alluvial flats. These soils formed in silty alluvium derived from various kinds of rock with a strong influence of volcanic ash. Slope is 0 to 2 percent. Elevation is 4,700 to 6,200 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of an Ocala silty clay loam, occasionally flooded, in an area of Batan-Ocala association, about 6 miles southeast of Crescent Valley, about 2,500 feet north and 500 feet west of the southeast corner of sec. 4, T. 28 N., R. 48 E.

A—0 to 3 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate thin platy structure; slightly hard, friable, very sticky and plastic; few very fine roots; many very fine tubular and vesicular pores; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (2 to 4 inches thick)

C1—3 to 9 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, sticky and plastic; common fine and very fine roots; few very fine tubular and vesicular pores; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (4 to 7 inches thick)

C2—9 to 14 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, sticky and plastic; common fine and very fine roots; few very fine tubular pores; violently effervescent; strongly alkaline (pH 8.5); clear wavy boundary. (5 to 10 inches thick)

Cqk1—14 to 21 inches; very pale brown (10YR 7/3) silty clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, sticky and plastic; common fine and very fine roots; few very fine tubular pores; 20 percent brittle durinodes; violently effervescent; strongly alkaline (pH 8.5); abrupt wavy boundary. (5 to 8 inches thick)

Cqk2—21 to 30 inches; light gray (10YR 7/2) silt loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; common very fine tubular pores; 25 percent brittle durinodes; violently effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (7 to 14 inches thick)

Cqk3—30 to 37 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; common fine distinct reddish brown (7.5YR 7/6) iron mottles, dark brown (10YR 3/2) moist; massive; continuous weak silica and lime cementation; hard, firm, slightly sticky and slightly plastic; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (6 to 8 inches thick)

C'—37 to 60 inches; very pale brown (10YR 7/3) silty clay loam, brown (10YR 5/3) massive; slightly hard, friable, sticky and plastic; violently effervescent; strongly alkaline (pH 8.6).

These soils are usually saturated to a depth of 40 inches for 1 month or more during most years. The mean annual soil temperature is 50 to 52 degrees F. More that one-half of the upper 20 inches is 15 to 50 percent or more exchangeable sodium; the percentage decreases at a depth of more than 20 inches. Where mixed, the particle-size control section is 25 to 35 percent clay and less than 15 percent sand that is fine or coarser. Depth to the Cqk horizon is 13 to 20 inches. The Cqk horizon is 20 to 70 percent brittle durinodes in the matrix above the continuous weakly cemented part. Reaction is strongly alkaline or very strongly alkaline.

The A horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3.

The C and Cqk horizons have value of 6 or 7 when dry and 4 to 6 when moist, and they have chroma of 2 or 3. They are silt loam or silty clay loam.

Paranat Series

The Paranat series consists of very deep, poorly drained, moderately slowly permeable soils on flood plains. The drainage has been altered by stream entrenchment. These soils formed in silty alluvium derived from loess and various kinds of rock. Slope is 0 to 2 percent. Elevation is 4,700 to 4,900 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 46 degrees F. The frost-free season is about 100 to 120 days.

Typical pedon of Paranat silt loam, drained, occasionally flooded, about 9 miles south of Crescent Valley, about 1,000 feet north and 2,100 feet west of the southeast corner of sec. 17, T. 28 N., R. 48 E.

A1—0 to 3 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine interstitial and tubular pores; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (2 to 5 inches thick)

A2—3 to 10 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; few fine and medium distinct yellowish brown (10YR 5/4) iron mottles, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, friable, sticky and plastic; many fine and very fine roots; many very fine tubular pores; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (7 to 9 inches thick)

C1—10 to 25 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; few fine faint (10YR 5/4) iron mottles; moderate fine subangular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots; common very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (8 to 15 inches thick)

C2—25 to 35 inches; light brownish gray (10YR 6/2) silt loam, brown (10YR 4/3) moist; few fine distinct yellowish brown (10YR 5/6) iron mottles; massive; slightly hard, friable, sticky and slightly plastic; many very fine and fine roots; common very fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (5 to 15 inches thick)

Ck1—35 to 50 inches; light yellowish brown (10YR 6/4) silty clay loam, dark yellowish brown (10YR 4/4) moist; common fine distinct brown (10YR 4/3) iron mottles; massive; hard, friable, very sticky and plastic; common very fine roots; few very fine tubular pores; few fine filaments and soft masses of lime; violently effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (10 to 15 inches thick)

Ck2—50 to 60 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; many medium distinct yellowish brown (10YR 5/6) mottles; massive; slightly hard, friable, slightly sticky and plastic; few very fine roots; few very fine tubular pores; few fine filaments and soft masses of lime; violently effervescent; strongly alkaline (pH 9.0).

These soils are usually moist; they are continuously dry in all parts between depths of 4 and 12 inches for 60 to 80 days late in summer and in fall and are saturated between depths of 40 and 60 inches for 90 to 120 days. The mean annual soil temperature is 47 to 49 degrees F. The particle-size control section averages 18 to 35 percent clay and is stratified silt loam to silty clay loam.

The A horizon has chroma of 1 or 2.

The C horizon has chroma of 2 to 4.

Pedoli Series

The Pedoli series consists of very deep, well drained, moderately slowly permeable soils on fan piedmont remnants. These soils formed in alluvium derived from

various kinds of rock. Slope is 0 to 4 percent. Elevation is 6,000 to 7,000 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Pedoli loam, 0 to 4 percent slopes, in an area of Pedoli-Poorcal association, about 24 miles south of Eureka, about 1,800 feet east and 1,320 feet north of Eightmile well, in projected sec. 13, T. 15 N., R. 52 E.

A—0 to 4 inches; light brownish gray (10YR 6/2) loam, brown (10YR 4/3) moist; moderate medium platy structure; soft, friable, slightly sticky and slightly plastic; few fine roots; common fine vesicular pores; 5 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (4 to 7 inches thick)

Bt—4 to 16 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, sticky and plastic; common medium, fine, and very fine roots; common fine and very fine tubular pores; common thin clay films lining pores and on ped faces; 10 percent pebbles; strongly alkaline (pH 8.6); clear wavy boundary. (12 to 16 inches thick)

Bk—16 to 54 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine tubular and interstitial pores; 40 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (20 to 38 inches thick)

Bqk—54 to 60 inches; very pale brown (10YR 8/3) gravelly loam, very pale brown (10YR 7/3) moist; massive; soft, friable, nonsticky and nonplastic; few fine roots; common fine and very fine interstitial pores; common fine lime veins; moderately thick lime and silica coatings on pebbles; 15 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is about 45 to 47 degrees F. The A and Bt horizons are 16 to 23 inches thick.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. The upper 7 inches, when mixed, has an average value of more than 5.5 when dry and 3.5 when moist.

The Bt horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 3 or 4. It is loam or clay loam that is 25 to 35 percent clay modified with 10 to 25 percent pebbles. The horizon has angular blocky or subangular blocky structure. Reaction is moderately alkaline or strongly alkaline.

The Bk and Bqk horizons are stratified gravelly loam to very gravelly loamy sand with an average of 35 to 50 percent pebbles. These horizons have value of 6 to 8 when dry and 5 to 7 when moist, and they have chroma of 3 or 4. They have lime concretions in some pedons. The undersides of the pebbles are coated with lime and silica. The Bk and Bqk horizons are 5 to 20 percent durinodes in some pedons. They are moderately alkaline or strongly alkaline and are strongly effervescent or violently effervescent.

Pedoli Variant

The Pedoli Variant consists of moderately deep, well drained, moderately permeable soils on low hillsides. These soils formed in residuum and colluvium derived from calcareous shale and limestone. Slope is 15 to 30 percent. Elevation is 5,700 to 6,700 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Pedoli Variant loam, 15 to 30 percent slopes, in an area of Weigle-Pedoli Variant association, about 45 miles south of Carlin, about 150 feet north and 2,200 feet west of the southeast corner of sec. 5, T. 25 N., R. 50 E.

A—0 to 3 inches; light brownish gray (10YR 6/2) loam, dark yellowish brown (10YR 4/4) moist; weak thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many medium and fine vesicular pores; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 5 inches thick)

Bt—3 to 6 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; moderate fine angular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common medium and fine tubular pores; common moderately thick clay films lining pores and on ped faces; 10 percent pebbles; moderately alkaline (pH 8.4); abrupt wavy boundary. (2 to 4 inches thick)

Btk—6 to 11 inches; very pale brown (10YR 7/4) gravelly loam, yellowish brown (10YR 5/4) moist; moderate fine angular blocky structure; hard, friable, slightly sticky and slightly plastic; few medium roots and common fine and very fine roots; common fine and very fine tubular pores; common moderately thick clay films on ped faces; common fine lime veins; 15 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (0 to 5 inches thick)

Bk1—11 to 21 inches; very pale brown (10YR 8/3) gravelly sandy loam, light yellowish brown (10YR 6/4) moist; massive; hard, friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores;

common fine lime veins; 25 percent pebbles; violently effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (10 to 12 inches thick)
Bk2—21 to 26 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 65 percent pebbles; slightly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (5 to 7 inches thick)
Cr—26 inches; weathered shale.

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature ranges from 45 to 47 degrees F. Depth to lime is 5 to 12 inches. Depth to paralithic contact ranges from 20 to 36 inches. Where mixed, the argillic horizon averages 18 to 25 percent clay modified with 10 to 25 percent pebbles.

The A horizon has value of 4 or 5 when moist, and it has chroma of 2 to 4.

The Bt and Btk horizons have value of 6 or 7 when dry and 4 or 5 when moist, and they have chroma of 3 or 4. They are loam or gravelly loam. They have angular blocky or subangular blocky structure. Reaction is moderately alkaline or strongly alkaline.

The Bk horizon has value of 6 to 8 when dry and 5 or 6 when moist, and it has chroma of 3 or 4. It is gravelly sandy loam in the upper part and very gravelly sandy loam or extremely gravelly sandy loam in the lower part. The upper part is 25 to 35 percent pebbles, and the lower part is 35 to 70 percent.

These soils are a variant of the Pedoli series because they have an argillic horizon that is less than 25 percent clay and they are moderately deep to bedrock.

Perwick Series

The Perwick series consists of moderately deep, well drained, moderately permeable soils on low hills. These soils formed in residuum derived from consolidated lake sediment and siltstone. Slope is 4 to 50 percent. Elevation is 5,100 to 6,000 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Perwick gravelly loam, 15 to 50 percent slopes, in an area of Perwick-Puett-Tulase association, about 37 miles south of Carlin, about 50 feet west and 1,250 feet north of the southeast corner of sec. 31, T. 27 N., R. 52 E.

A—0 to 3 inches; light brownish gray (10YR 6/2) gravelly loam, dark grayish brown (10YR 4/2) moist; weak very thin and thin platy structure; soft, very friable, sticky and plastic; many very fine and fine roots; many very fine vesicular pores; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (3 to 7 inches thick)
C1—3 to 16 inches; pale brown (10YR 6/3) gravelly silt loam, brown (10YR 4/3) moist; massive; slightly hard, friable, sticky and plastic; common very fine roots and few coarse, medium, and fine roots; common very fine tubular pores; 25 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt irregular boundary. (9 to 13 inches thick)
C2—16 to 26 inches; light gray (2.5Y 7/2) fine sandy loam, light yellowish brown (2.5Y 6/4) moist; massive; slightly hard and hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine and fine tubular pores; common fine and medium lime filaments; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); abrupt irregular boundary. (8 to 20 inches thick)
Cr—26 inches; white, fractured diatomaceous siltstone; common very fine and fine tubular pores; strongly effervescent.

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 48 to 50 degrees F. Depth to a paralithic contact ranges from 20 to 40 inches. Where mixed, the particle-size control section average 10 to 35 percent rock fragments. The profile is strongly effervescent or violently effervescent. Reaction is moderately alkaline to very strongly alkaline.

The A horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3.

The C horizon has hue of 10YR or 2.5Y, value of 6 or 7 when dry and 4, 5, or 6 when moist, and chroma of 2 or 3. It is sandy loam, fine sandy loam, silt loam, or loam and averages 10 to 35 percent rock fragments.

Perwick Variant

The Perwick Variant consists of very deep, well drained, moderately rapidly permeable soils on fan skirts These soils formed in highly calcareous alluvium derived from various kinds of rock. Slope is 2 to 15 percent. Elevation is 5,700 to 6,100 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 47 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Perwick Variant gravelly loam, 2 to 8 percent slopes, in an area of Perwick Variant association, on the east side of Grass Valley, about 17 miles south of Cortez about 2,000 feet south and 1,400 feet east of the northwest corner of sec. 4, T. 23 N., R. 48 E.

About 1 percent of the surface is covered with stones.

A1—0 to 3 inches; light brownish gray (2.5Y 6/2) gravelly loam, dark grayish brown (2.5Y 4/2) moist;

strong thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine vesicular pores; 20 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (1 to 4 inches thick)

A2—3 to 9 inches; light brownish gray (2.5Y 6/2) gravelly loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine and fine roots and common medium roots; common very fine tubular pores; 25 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (4 to 9 inches thick)

Bk1—9 to 14 inches; pale brown (10YR 6/3) extremely gravelly loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, sticky and plastic; common very fine and fine roots and few medium roots; common very fine tubular pores; 60 percent pebbles; lime pendants coating the underside of pebbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (5 to 9 inches thick)

Bk2—14 to 20 inches; light gray (10YR 7/2) very gravelly loam, dark brown (10YR 4/3) moist; massive; hard, firm, sticky and slightly plastic; few very fine and fine roots; many very fine tubular pores; 40 percent pebbles; many fine lime filaments; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (6 to 10 inches thick)

2Bk—20 to 40 inches; brown (10YR 5/3) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, slightly sticky and nonplastic; many very fine roots; common very fine tubular and interstitial pores; 70 percent pebbles; common fine lime filaments and coatings on the underside of pebbles; violently effervescent; strongly alkaline; strongly (pH 8.6); clear irregular boundary. (20 to 30 inches thick)

2C—40 to 60 inches; brown (10YR 5/3) extremely gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular and interstitial pores; 65 percent pebbles; violently effervescent; strongly alkaline (pH 8.6).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 47 to 49 degrees F. Where mixed, the particle-size control section averages 5 to 18 percent clay and 50 to 70 percent pebbles and commonly has calcium carbonate equivalent of 15 to 40 percent.

The A horizon has value of 6 or 7 when dry and 3 to 5 when moist, and it has chroma of 2 or 3. It is mildly alkaline or moderately alkaline.

The Bk horizon has hue of 10YR or 2.5Y, value of 5, 6, or 7 when dry and 4 or 5 when moist, and chroma of 2, 3, or 4. Lime pendants commonly are on the underside of pebbles. Reaction increases with increasing depth, ranging from moderately alkaline or strongly alkaline to strongly alkaline or very strongly alkaline.

Pie Creek Series

Pie Creek series consists of moderately deep, well drained, very slowly permeable soils on mountains. These soils formed in residuum derived from tuff. Slope is 15 to 30 percent. Elevation is 5,500 to 7,000 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Pie Creek very cobbly loam, 15 to 30 percent slopes, in an area of Chen-Pie Creek-Ramires association, about 19 miles south of Crescent Valley, about 2,375 feet west and 1,050 feet north of the southeast corner of sec. 3, T. 26 N., R. 48 E.

About 50 percent of the surface is covered rock fragments, of which 25 percent is cobbles and 25 percent is pebbles.

A1—0 to 4 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; weak thin platy structure that parts to moderate fine and very fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few medium, common fine, and many very fine roots; common medium, fine, and very fine vesicular pores; 25 percent cobbles and 25 percent pebbles; neutral (pH 7.0); abrupt smooth boundary. (4 to 6 inches thick)

A2—4 to 7 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; strong medium subangular blocky structure; hard, friable, sticky and plastic; few medium and fine roots and common very fine roots; few medium and many fine and very fine tubular pores; 10 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (3 to 6 inches thick)

E—7 to 8 inches; grayish brown and light brownish gray (10YR 5/2, 6/2) loam, dark brown (10YR 3/3) moist; many bleached sand grains; strong medium subangular blocky structure; hard, friable, sticky and plastic; few medium and fine roots and common very fine roots; few medium and many fine and very fine tubular pores; 10 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (1/8 to 1 inch thick)

Bt—8 to 15 inches; brown (7.5YR 4/4) fine clay, reddish brown (5YR 4/4) moist; moderate medium prismatic structure; very hard, very firm, very sticky and very plastic; few medium and fine roots and common very fine roots; few medium and many fine and very fine tubular pores; continuous moderately thick clay films lining pores and on ped faces; 5 percent

pebbles; neutral (pH 7.2); clear wavy boundary. (6 to 9 inches thick)
Btk—15 to 23 inches; brown (7.5YR 5/4) clay, yellowish red (5YR 4/6) moist; massive; hard, firm, very sticky and very plastic; few fine and very fine tubular pores; common fine lime veins; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary. (7 to 12 inches thick)
R—23 inches; hard welded tuff.

These soils are usually dry from mid-June to early in October. The mean annual soil temperature ranges from 45 to 47 degrees F. The mollic epipedon is 8 to 12 inches thick. Depth to bedrock ranges from 23 to 30 inches. Depth to lime ranges from 15 to 20 inches.

Pie Creek Variant

The Pie Creek Variant consists of well drained, moderately permeable soils that are moderately deep to a petrocalcic horizon. These soils are on fan piedmonts. They formed in alluvium derived from limestone and dolomite. Slope is 2 to 8 percent. Elevation is 7,000 to 7,600 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Pie Creek Variant gravelly fine sandy loam, 2 to 8 percent slopes, in an area of Ados Variant-Pie Creek Variant-Jesse Camp association, about 9 miles west of Eureka, about 1,200 feet east and 1,700 feet south of the northwest corner of sec. 3, T. 18 N., R. 52 E.

A1—0 to 3 inches; grayish brown (10YR 5/2) gravelly fine sandy loam, dark brown (10YR 3/3) moist; moderate thick platy structure; slightly hard, friable, nonsticky and slightly plastic; common fine and very fine roots; common fine and very fine vesicular pores; 15 percent pebbles; moderately alkaline (pH 8.0); abrupt smooth boundary. (3 to 4 inches thick)
A2—3 to 7 inches; grayish brown (10YR 5/2) gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; many fine and very fine interstitial and tubular pores; 15 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (4 to 5 inches thick)
Bw1—7 to 10 inches; grayish brown (10YR 5/2) gravelly loam, dark brown (10YR 3/3) moist; moderate medium angular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine tubular pores; 15 percent pebbles; strongly effervescent; moderately alkaline; (pH 8.4); abrupt smooth boundary. (3 to 4 inches thick)
Bw2—10 to 15 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium angular blocky structure; hard, friable, sticky and plastic; common very fine roots; common fine and very fine tubular pores; 35 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (5 to 7 inches thick)
Bk—15 to 25 inches; light gray (10YR 7/2) very gravelly loam, pale brown (10YR 6/3) moist; weak fine subangular blocky structure; hard, firm, sticky and plastic; common very fine roots; common fine and very fine tubular pores; 50 percent pebbles; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (0 to 10 inches thick)
Bkm—25 inches; white (10YR 8/2) indurated petrocalcic horizon, very pale brown (10YR 6/3) moist; massive; extremely hard, extremely firm; few very fine tubular pores; violently effervescent; strongly alkaline (pH 8.8).

These soils are usually dry; they are moist in winter and spring but are dry in July to October. The mean annual soil temperature is 45 to 47 degrees F. Depth to the petrocalcic horizon is 20 to 26 inches. The mollic epipedon is 7 to 12 inches thick. The particle-size control section is loam or very gravelly clay loam; it averages 18 to 30 percent clay and 35 to 50 percent rock fragments. The calcium carbonate equivalent is 40 to 60 percent.

The A horizon has chroma of 2 or 3. It has platy or subangular blocky structure.

The Bw horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. It has angular blocky or subangular blocky structure.

Piltdown Series

The Piltdown series consists of very deep, well drained, moderately permeable soils on fan skirts. These soils formed in alluvium derived from various kinds of rock with some influence of loess. Slope is 0 to 2 percent. Elevation is 5,900 to 6,200 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Piltdown fine sandy loam, about 16 miles south of Eureka, about 1,320 feet west and 1,980 feet north of the southeast corner of sec. 29, T. 17 N., R. 53 E.

A—0 to 6 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak thin platy structure parting to weak fine subangular blocky; soft, friable, nonsticky and nonplastic; few fine and very fine roots; few fine and very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (4 to 7 inches thick)
C1—6 to 21 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak medium and fine subangular blocky structure; soft, friable,

nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 5 percent pebbles; violently effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (8 to 15 inches thick)

C2—21 to 39 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; common fine and very fine interstitial pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (15 to 20 inches thick)

C3—39 to 60 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; few fine and very fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.2).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 47 to 53 degrees F. The particle-size control section is fine sandy loam, very fine sandy loam, or sandy loam; it is 10 to 18 percent clay. In some pedons are thin strata that are as much as 25 percent pebbles. Below a depth of 40 inches the textures are variable and can include strata of very gravelly loamy sand. Reaction is mildly alkaline to strongly alkaline.

The A horizon has value of 5 to 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3.

The C horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3.

Pineval Series

The Pineval series consists of very deep, well drained, moderately slowly permeable soils on fan piedmont remnants. These soils formed in alluvium derived mainly from basalt and rhyolite. Slope is 4 to 15 percent. Elevation is 5,100 to 5,900 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Pineval gravelly loam, 4 to 15 percent slopes, in an area of Pineval-Tulase-Perwick association, about 41 miles south of Carlin, about 2,100 feet north and 250 feet east of the southwest corner of sec. 14, T. 26 N., R. 51 E.

A—0 to 3 inches; light brownish gray (2.5Y 6/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; strong very thin platy structure; soft, very friable, slightly sticky and plastic; many very fine and fine roots; many very fine and fine vesicular pores; 20 percent pebbles; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 4 inches thick)

Bt1—3 to 6 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, sticky and very plastic; many very fine and fine roots and few medium roots; many very fine interstitial and tubular pores; common thin clay films on peds and in pores; 40 percent pebbles; moderately alkaline (pH 8.2); abrupt wavy boundary. (3 to 6 inches thick)

Bt2—6 to 11 inches; pale brown (10YR 6/3) very gravelly sandy clay loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, sticky and plastic; common very fine and fine roots and few medium roots; common very fine tubular pores; few thin clay films on peds and common thin clay films in pores; 50 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (4 to 7 inches thick)

Bqk—11 to 21 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and slightly plastic; few very fine, fine, and medium roots; common very fine tubular pores; 40 percent weak and very weak discontinuous silica cementation; 35 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (8 to 20 inches thick)

2Bqk—21 to 60 inches; variegated extremely gravelly sand; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; continuous weak silica cementation with several 0.5- to 6.0-inch-thick discontinuous lenses of strong silica cementation; lime coatings on the underside of pebbles; 70 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature ranges from 48 to 50 degrees F. Reaction is mildly alkaline or moderately alkaline throughout.

The A horizon has hue of 10YR or 2.5Y, value of 5 or 6 when dry and 3 or 4 when moist, and chroma of 2 or 3.

The Bt horizon has value of 5 or 6 when dry, and it has chroma of 3 or 4. It is heavy loam, clay loam, or sandy clay loam. It is 25 to 35 percent clay modified with 35 to 60 percent pebbles.

The Bqk and 2Bqk horizons have value of 6 or 7 when dry and 4 or 5 when moist, and they have chroma of 2 or 3. They are sand, loamy sand, or sandy loam modified with 35 to 70 percent pebbles.

Poorcal Series

The Poorcal series consists of very deep, well drained, moderately permeable soils on inset fan remnants and

inset fans. These soils formed in alluvium derived from calcareous rock with some influence of loess and volcanic ash. Slope is 0 to 4 percent. Elevation is 6,200 to 7,000 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of Poorcal loam, 0 to 4 percent slopes, about 18 miles west of Eureka, about 1,000 feet south and 1,000 feet east of the northwest corner of sec. 25, T. 19 N., R. 50 E.

A1—0 to 2 inches; very pale brown (10YR 7/3) loam, dark brown (10YR 4/3) moist; moderate very fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; many medium and fine vesicular pores and many fine and very fine interstitial pores; 5 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (1 to 3 inches thick)

A2—2 to 5 inches; very pale brown (10YR 7/3) loam, dark brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; many medium and fine vesicular pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 7 inches thick)

Bw—5 to 14 inches; very pale brown (10YR 7/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, friable, nonsticky and nonplastic; common fine and very fine roots; many very fine interstitial pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (3 to 10 inches thick)

Bqk—14 to 29 inches; white (10YR 8/2) gravelly sandy loam, very pale brown (10YR 7/3) moist; massive; hard, firm, nonsticky and nonplastic; few fine and very fine roots; many very fine interstitial pores; 25 percent very hard, firm, brittle durinodes; 15 percent pebbles; thick lime and silica coatings on the underside of rock fragments; violently effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (6 to 15 inches thick)

2Bqk—29 to 60 inches; very pale brown (10YR 8/3) very gravelly loamy sand, light yellowish brown (10YR 6/4) moist; single grain; loose, nonsticky and nonplastic; few fine and very fine roots; many fine and very fine interstitial pores; 25 percent very hard, firm, brittle durinodes; 35 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 45 to 47 degrees F. Thickness of the A and Bw horizons is 8 to 20 inches. Where mixed, the particle-size control section is 5 to 18 percent clay and 15 to 35 percent rock fragments, mostly pebbles. The calcium carbonate equivalent of the calcic horizon is 15 to 35 percent.

The A horizon has value of 5 to 7 when dry and 3 or 4 when moist, and it has chroma of 2 or 3.

The Bw horizon has value of 5 to 7 when dry and 3 to 5 when moist, and it has chroma of 3 or 4.

The Bqk horizon has value of 6 to 8 when dry and 5 to 7 when moist, and it has chroma of 2 to 4. It is gravelly sandy loam, loam, or gravelly loam. It has 20 to 40 percent durinodes.

The 2Bqk horizon has value of 6 to 8 when dry and 5 to 7 when moist, and it has chroma of 2 to 4. It is very gravelly loamy sand, very gravelly sandy loam, or very gravelly loam. It has 20 to 40 percent durinodes.

Puett Series

The Puett series consists of shallow, well drained, moderately rapidly permeable soils on low hills. These soils formed in residuum derived from tuff, shale, siltstone, and sandstone. Slope is 15 to 50 percent. Elevation is 5,100 to 6,000 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Puett gravelly loam, 15 to 50 percent slopes, eroded, in an area of Perwick-Puett-Tulase association; about 38 miles south of Carlin, about 1,500 feet north and 2,600 feet west of the southeast corner of sec. 31, T. 27 N., R. 52 E.

A—0 to 5 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak thin and medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine vesicular pores; 30 percent pebbles; strongly effervescent; moderately alkaline; (pH 8.4); clear wavy boundary. (1 to 7 inches thick)

C1—5 to 10 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots and few coarse roots; common very fine tubular pores; 25 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (5 to 8 inches thick)

C2—10 to 17 inches; very pale brown (10YR 7/3) gravelly loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; 25 percent pebbles; lime coatings on pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (4 to 7 inches thick)

Cr—17 inches; soft, weathered siltstone.

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 47 to 50 degrees F. Depth to paralithic contact is 10 to 20 inches. Rock fragment content is 5 to 35 percent throughout the profile. The profile is loam to coarse sandy loam. It has value of 6 or

7 when dry and 4 or 5 when moist, and it has chroma of 3 or 4. It is moderately alkaline or strongly alkaline.

Pumper Series

The Pumper series consists of very deep, somewhat excessively drained, moderately permeable soils on fan skirts. These soils formed in loess that is high in content of volcanic ash and is underlain by gravelly alluvium. Slope is 0 to 2 percent. Elevation is 5,500 to 6,400 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 50 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of Pumper sandy loam, cool; about 24 miles south of Eureka; about 1,080 feet east and 660 feet south of the northwest corner of sec. 14, T. 15 N., R. 53 E.

A—0 to 6 inches; light gray (10YR 7/2) sandy loam, brown (10YR 4/3) moist; moderate medium platy structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; few medium, fine, and very fine roots; common fine and very fine vesicular and interstitial pores; 10 percent pebbles; moderately alkaline (pH 8.2); abrupt smooth boundary. (4 to 7 inches thick)

Bw—6 to 13 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; common fine and very fine roots; many fine and very fine interstitial pores; 10 percent pebbles; moderately alkaline (pH 8.2); clear wavy boundary. (7 to 13 inches thick)

2Bk1—13 to 29 inches; pale brown (10YR 6/3) very gravelly sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; common fine and very fine roots; many fine and very fine interstitial pores; common moderately thick and thick coatings on pebbles; 50 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (15 to 19 inches thick)

2Bk2—29 to 60 inches; very pale brown (10YR 7/3) extremely gravelly coarse sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; few fine roots; many fine and very fine interstitial pores; common moderately thick and thick lime coatings on pebbles; 60 percent pebbles; violently effervescent; strongly alkaline (pH 8.8).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature ranges from 51 to 53 degrees F. Depth to the 2Bk1 horizon ranges from 11 to 20 inches. The particle-size control section averages very gravelly or extremely gravelly coarse sand with 50 to 70 percent pebbles.

The A horizon has hue of 10YR or 2.5Y, value of 6 or 7 when dry and 4 or 5 when moist, and chroma of 2 or 3. Reaction is mildly alkaline to strongly alkaline.

The Bw horizon has hue of 10YR or 2.5Y, value of 5 to 7 when dry and 3 or 4 when moist, and chroma of 2 or 3. It is massive or has subangular blocky or prismatic structure. Reaction is mildly alkaline to strongly alkaline.

The 2Bk horizon has hue of 10YR or 2.5Y, value of 4 to 8 when dry and 3 to 6 when moist, and chroma of 1 to 3. Texture of the fine earth is sand or coarse sand. Reaction is moderately alkaline or strongly alkaline.

The Pumper soils in this survey area are taxadjunct to the Pumper series because the frost-free season is shorter. This difference, however, does not significantly affect use and management.

Quarz Series

The Quarz series consists of moderately deep, well drained, slowly permeable soils on side slopes of mountains. These soils formed in residuum derived from sandstone, shale, quartzite, or quartz latite. Slope is 8 to 50 percent. Elevation is 5,600 to 7,600 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Quarz very gravelly loam, 15 to 50 percent slopes, in an area of Quarz-Highams-Atrypa Variant association, about 38 miles south of Carlin, about 100 feet west and 1,800 feet south of the northeast corner of sec. 15, T. 26 N., R. 52 E.

About 15 percent of the surface is covered with pebbles.

A1—0 to 5 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate thin platy structure; soft, very friable, sticky and plastic; many very fine roots; common very fine tubular pores; 40 percent pebbles; mildly alkaline (pH 7.4); clear wavy boundary. (3 to 8 inches thick)

A2—5 to 11 inches; grayish brown (10YR 5/2) very gravelly clay loam, very dark grayish brown (10YR 3/2) moist; weak very thin and thin platy structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; 40 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (4 to 8 inches thick)

Bt1—11 to 19 inches; light yellowish brown (10YR 6/4) very gravelly clay, brown (10YR 4/3) moist; moderate fine angular blocky structure; hard, friable, very sticky and very plastic; common very fine and few fine roots; many very fine tubular pores; continuous thin clay films on faces of peds and lining pores; 45 percent pebbles and 10 percent cobbles; mildly alkaline (pH 7.4); clear wavy boundary. (6 to 8 inches thick)

Bt2—19 to 30 inches; brown (7.5YR 5/4) very gravelly clay, dark brown (7.5YR 4/4) moist; weak fine and medium angular blocky structure; hard, friable, very sticky and very plastic; few very fine roots; many very fine tubular pores; continuous thin clay films lining pores and on faces of peds; 30 percent pebbles and 10 percent cobbles; neutral (pH 6.8); abrupt irregular boundary. (6 to 11 inches thick)
R—30 inches; interbedded sandstone, shale, and quartzite.

These soils are usually dry; they are moist in winter and spring but are dry in mid-July to October. The mean annual soil temperature is 44 to 47 degrees F. Depth to bedrock is 20 to 30 inches. The mollic epipedon is 7 to 16 inches thick. The particle-size control section is 35 to 55 percent clay and is 35 to 60 percent rock fragments, mainly pebbles. Reaction is neutral or mildly alkaline.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3.

The Bt horizon has hue of 5YR, 7.5YR, or 10YR, value of 5 or 6 when dry and 3 or 4 when moist, and chroma of 3 to 5. It has subangular blocky, angular blocky, or prismatic structure.

Ramires Series

The Ramires series consists of moderately deep, well drained, slowly permeable soils on side slopes of mountains. These soils formed in residuum derived from tuff and rhyolite and from andesite with a strong influence of loess that is high in content of volcanic ash. Slope is 15 to 50 percent. Elevation is 5,500 to 7,000 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Ramires loam, 15 to 30 percent slopes, in an area of Chen-Ramires association, moderately steep; about 5 miles south and 17 miles east of Crescent Valley, about 1,000 feet east and 500 feet south of the northwest corner of sec. 29, T. 29 N., R. 51 E.

About 20 percent of the surface is covered with pebbles and cobbles.

A1—0 to 4 inches; grayish brown (10YR 5/2) loam, very dark gray (10YR 3/1) moist; moderate very fine and fine granular structure; slightly hard, friable, sticky and plastic; many very fine roots; many very fine tubular pores; 10 percent pebbles; neutral (pH 7.2); clear smooth boundary. (2 to 4 inches thick)
A2—4 to 9 inches; grayish brown (10YR 5/2) gravelly clay loam, very dark gray (10YR 3/1) moist; weak very fine and fine granular structure; slightly hard, friable, sticky and plastic; many very fine and fine roots and few fine roots; many very fine tubular pores; 15 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (5 to 7 inches thick)
Bt1—9 to 16 inches; brown (10YR 5/3) gravelly clay, dark grayish brown (10YR 4/2) moist; moderate medium and coarse prismatic structure; hard, firm, very sticky and very plastic; common very fine roots and few fine and medium roots; common very fine tubular pores; continuous moderately thick clay films lining pores; continuous moderately thick pressure faces; 15 percent pebbles; mildly alkaline (pH 7.4); gradual wavy boundary. (4 to 8 inches thick).
Bt2—16 to 26 inches; pale brown (10YR 6/3) gravelly clay, brown (10YR 4/3) moist; weak medium and coarse prismatic structure; hard, firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; continuous moderately thick clay films lining pores; continuous moderately thick pressure faces; 20 percent pebbles; mildly alkaline (pH 7.6); clear irregular boundary. (8 to 12 inches thick)
Btk—26 to 33 inches; very pale brown (10YR 7/3) very gravelly clay, brown (10YR 5/3) moist; massive; hard, firm, sticky and very plastic; few very fine roots; few very fine tubular pores; common thin clay films lining pores and bridging sand grains; common thin and few medium filaments and soft masses of lime; 40 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt irregular boundary. (5 to 9 inches thick)
R—33 inches; andesite.

These soils are usually dry from mid-June to mid-October. The mean annual soil temperature ranges from 45 to 47 degrees F. Depth to bedrock is 24 to 40 inches. The mollic epipedon is 8 to 11 inches thick. Depth to lime is 20 to 31 inches.

The A horizon has chroma of 1 or 2.

The Bt horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. It is clay loam or clay. It averages 35 to 50 percent clay and 5 to 35 percent rock fragments. Reaction is neutral or mildly alkaline.

The Btk horizon is very gravelly clay, sandy loam, or sandy clay loam.

Ravenswood Series

The Ravenswood series consists of moderately deep, well drained, slowly permeable soils on side slopes of mountains. These soils formed in colluvium and residuum derived from volcanic, metavolcanic, and metamorphic rocks. Slope is 15 to 50 percent. Elevation is 6,000 to 8,000 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Ravenswood extremely stony loam, 15 to 30 percent slopes, in an area of Ravenswood-Shagnasty-Walti association, about 8 miles southwest of

Eureka, about 1,500 feet north and 2,000 feet east of the southwest corner of sec. 23, T. 18 N., R. 52 E.

About 25 percent of the surface is covered with stones.

A1—0 to 4 inches; grayish brown (10YR 5/2) extremely stony loam, very dark grayish brown (10YR 3/2) moist; moderate thick platy structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; few medium and common fine vesicular pores; 10 percent pebbles and 5 percent cobbles; neutral (pH 7.0); clear smooth boundary. (3 to 4 inches thick)

A2—4 to 8 inches; brown (10YR 5/3) cobbly loam, dark brown (10YR 3/3) moist; weak medium platy structure parting to moderate medium subangular blocky; soft, friable, slightly sticky and slightly plastic; common medium roots and fine and very fine roots; many fine and very fine interstitial pores and common fine and very fine tubular pores; 10 percent pebbles and 5 percent cobbles; neutral (pH 7.0); clear wavy boundary. (3 to 5 inches thick)

Bt1—8 to 13 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; strong fine angular blocky structure; hard, firm, sticky and plastic; many fine and very fine roots; common fine tubular pores; common thin pressure faces on peds; 35 percent pebbles; neutral (pH 7.0); clear wavy boundary. (3 to 7 inches thick)

Bt2—13 to 29 inches; yellowish brown (10YR 5/4) very gravelly clay, dark yellowish brown (10YR 3/4) moist; weak medium prismatic structure parting to strong medium angular blocky; very hard, very firm, very sticky and very plastic; common fine tubular pores; many thick pressure faces on peds; 35 percent pebbles and 5 percent cobbles; neutral (pH 7.0); clear irregular boundary. (10 to 18 inches thick)

Bt3—29 to 35 inches; pink (7.5YR 7/4) very gravelly clay loam, brown (10YR 5/4) moist; strong medium angular blocky structure; very hard, very firm, very sticky and very plastic; common fine tubular pores; common thin clay films lining pores and on ped faces; 35 percent pebbles and 5 percent cobbles; slightly effervescent; mildly alkaline (pH 7.6); clear irregular boundary. (6 to 10 inches thick)

R—35 inches; quartzite.

These soils are moist in winter and spring but are dry in mid-July to October. The mean annual soil temperature is 44 to 46 degrees. Depth to bedrock is 30 to 40 inches. Where mixed, the particle-size control section averages 35 to 50 percent clay modified with 35 to 60 percent rock fragments, mainly pebbles. The profile is neutral or mildly alkaline.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3. It has platy, subangular blocky, or granular structure.

The Bt horizon has hue of 7.5YR or 10YR, and it has value of 5 to 7 when dry and 3 to 5 when moist. It has prismatic or angular blocky structure.

Relley Series

The Relley series consists of very deep, well drained, moderately permeable soils on smooth fan skirts. These soils formed in alluvium derived from various kinds of rock with a strong influence of loess and volcanic ash. Slope is 0 to 2 percent. Elevation is 4,600 to 5,000 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Relley silt loam, 0 to 2 percent slopes, in an area of Creemon-Relley association, about 6 miles south and 6 miles east of Crescent Valley, about 1,300 feet west and 1,600 feet south of the northeast corner of sec. 6, T. 28 N., R. 49 E.

A—0 to 4 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and fine vesicular and tubular pores and few medium tubular pores; moderately alkaline (pH 8.0); abrupt wavy boundary. (3 to 7 inches thick)

Bw—4 to 11 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate medium prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine and few fine tubular pores; moderately alkaline (pH 8.2); abrupt wavy boundary. (6 to 10 inches thick)

Bq—11 to 14 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and plastic; common very fine and fine roots; many very fine and common fine tubular pores; 25 percent brittle durinodes; moderately alkaline (pH 8.4); abrupt wavy boundary. (2 to 6 inches thick)

Bqk—14 to 22 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, sticky and plastic; few very fine and fine roots; common very fine tubular pores; 25 percent brittle durinodes; common fine lime filaments; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (6 to 12 inches thick)

Bk1—22 to 25 inches; white (10YR 8/2) very fine sandy loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (3 to 7 inches thick)

Bk2—25 to 32 inches; variegated white (10YR 8/2) and pale brown (10YR 6/3) very fine sandy loam, pale

brown (10YR 6/3) and brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; few very fine roots; common very fine tubular pores; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (6 to 8 inches thick)

2Bqk—32 to 51 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; massive; hard, friable, sticky and plastic; 50 percent discontinuous weak silica cementation; common fine lime filaments; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (5 to 19 inches thick).

3Bk—51 to 60 inches; pale brown (10YR 6/3) coarse sandy loam, brown (10YR 5/3) moist; common fine distinct yellowish brown (10YR 5/6) iron mottles, common fine faint brown (10YR 5/3) moist; massive; soft, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 10 percent pebbles; strongly effervescent; very strongly alkaline (pH 9.2).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 49 to 51 degrees F. Depth to silica cementation is 11 to 17 inches.

The A horizon has value of 6 or 7 when dry and 3 or 4 when moist. Reaction is moderately alkaline or strongly alkaline.

The Bw horizon has value of 6 or 7 when dry, and it has chroma of 2 or 3 when dry and 3 or 4 when moist. Reaction is moderately alkaline or strongly alkaline.

The Bq, Bqk, and Bk horizons have value of 6 to 8 when dry and 4 to 6 when moist, and they have chroma of 2 or 3 when dry and 3 or 4 when moist. They are dominantly silt loam with strata of silty clay loam and very fine sandy loam. Some pedons are coarse sandy loam below a depth of 50 inches. Reaction is moderately alkaline to very strongly alkaline.

Ricert Series

The Ricert series consists of very deep, well drained, moderately slowly permeable soils on fan piedmonts. These soils formed in thin loess deposits overlying alluvium derived from mixed volcanic and sedimentary rocks. Slope is 0 to 8 percent. Elevation is 4,700 to 6,500 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 47 degrees F. The frost-free season is 90 to 100 days.

Typical pedon of a Ricert gravelly silt loam, 2 to 8 percent slopes, in an area of Broyles-Ricert association, about 12 miles south of Beowawe, 1,850 feet south and 2,375 feet west of the northeast corner of sec. 5, T. 29 N., R. 49 E.

A—0 to 5 inches; pale brown (10YR 6/3) gravelly silt loam, brown (10YR 4/3) moist; moderate thick platy structure parting to weak very thin platy; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium roots; few very fine tubular and vesicular pores; 20 percent pebbles; moderately alkaline (pH 8.2); abrupt wavy boundary. (3 to 8 inches thick)

Btn—5 to 9 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 4/4) moist; moderate medium prismatic structure; hard, friable, sticky and very plastic; common very fine and fine roots and few medium roots; common very fine tubular pores; many thin clay films on peds and lining pores; strongly alkaline (pH 8.5); abrupt wavy boundary. (4 to 9 inches thick)

Btnk—9 to 14 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure; slightly hard, friable, sticky and plastic; few very fine and fine roots and few medium roots; common very fine tubular pores; common thin clay films on peds and many thin clay films in pores; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (4 to 8 inches thick)

Bqk—14 to 20 inches; very pale brown (10YR 7/3) clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm; brittle; few very fine and fine roots; common very fine tubular pores; weak continuous silica and lime cementation; many fine and medium lime filaments; violently effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (6 to 12 inches thick)

2Bk—20 to 24 inches; light gray (10YR 7/2) gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and slightly plastic; common very fine and fine roots; few very fine vesicular and tubular pores; 30 percent lime-coated pebbles; few fine lime filaments; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (0 to 6 inches thick)

2Bky—24 to 60 inches; light gray (10YR 7/2) very gravelly sandy loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and slightly plastic; few very fine and fine roots; few very fine tubular pores; common fine gypsum filaments; 40 percent lime-coated pebbles and 5 percent cobbles; violently effervescent; strongly alkaline (pH 8.6).

These soils are moist in winter and spring; they are dry in June to October. The mean annual soil temperature is 47 to 49 degrees F. Thickness of the A and Btn horizons is 14 to 25 inches. The natric horizon is 25 to 35 percent clay, 0 to 10 percent pebbles, and 15 to 35 percent exchangeable sodium.

The A horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3.

The Btn and Btnk horizons have hue of 10YR or 7.5YR, value of 5 or 6 when dry and 4 or 5 when moist, and chroma of 3 or 4. They are loam or clay loam. Reaction is strongly alkaline or very strongly alkaline.

The Bqk horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 3 or 4. It is loam, silt loam, or light clay loam. Reaction is strongly alkaline or very strongly alkaline.

The 2B horizon is sandy loam or loamy sand. Rock fragment content ranges from 30 to 70 percent, but it averages more than 35 percent. Reaction is strongly alkaline or very strongly alkaline.

Robson Series

The Robson series consists of shallow, well drained, slowly permeable soils on lower side slopes of mountains. These soils formed in residuum derived from rhyolite, andesite, and tuff. Slope is 8 to 30 percent. Elevation is 6,000 to 7,500 feet. The mean annual precipitation is about 15 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 60 to 90 days.

Typical pedon of a Robson very stony loam, 8 to 15 percent slopes, in an area of Walti-Softscrabble-Robson association, about 34 miles northwest of Eureka, in the northwest corner of sec. 15, T. 21 N., R.48 E.

About 5 percent of the surface is covered with stones.

A—0 to 10 inches; brown (10YR 5/3) very stony loam, dark brown (10YR 4/3) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common medium, fine, and very fine roots; common medium vesicular pores; 10 percent pebbles, 10 percent cobbles, and 5 percent stones; neutral (pH 7.0); clear smooth boundary. (4 to 10 inches thick)

Bt1—10 to 14 inches; light yellowish brown (10YR 6/4) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots; common fine tubular pores; many moderately thick pressure faces on peds; 15 percent pebbles and 35 percent cobbles; neutral (pH 6.8); abrupt smooth boundary. (4 to 6 inches thick)

Bt2—14 to 19 inches; brown (7.5YR 6/4) extremely cobbly clay, dark brown (7.5YR 4/4) moist; strong coarse prismatic structure parting to strong medium and coarse angular blocky; very hard, very firm, very sticky and very plastic; few fine and very fine roots; few fine tubular pores; many thick pressure faces on peds; 15 percent pebbles and 45 percent cobbles; neutral (pH 6.8); abrupt wavy boundary. (4 to 7 inches thick)

R—19 inches; rhyolite.

These soils are moist in winter and spring, but they are dry late in June to October. The mean annual soil temperature ranges from 44 to 47 degrees F. Depth to bedrock is 12 to 20 inches. The argillic horizon is clay loam or clay. It averages 40 to 50 percent clay and is 50 to 75 percent rock fragments, mainly cobbles.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. It has platy, subangular blocky, or granular structure.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6 when dry and 3 or 4 when moist, and chroma of 3 or 4. It has angular blocky or prismatic structure.

The upper few inches of the R horizon commonly is fractured into angular cobble- or pebble-sized fragments.

Rubyhill Series

The Rubyhill series consists of well drained, moderately permeable soils that are moderately deep to a duripan. These soils are on fan piedmonts. They formed in alluvium derived from various kinds of rock. Slope is 0 to 8 percent. Elevation is 5,700 to 7,000 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Rubyhill sandy loam, 0 to 4 percent slopes, about 14 miles west and 7 miles north of Eureka, about 660 feet north of the southwest corner of sec. 22, T. 21 N., R. 51 E.

A1—0 to 3 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; many fine and very fine interstitial pores; 5 percent pebbles; neutral (pH 7.0); abrupt smooth boundary. (3 to 5 inches thick)

A2—3 to 6 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and slightly plastic; common medium and fine roots; common fine and very fine interstitial pores; neutral (pH 7.2); abrupt smooth boundary. (2 to 5 inches thick)

Bw1—6 to 12 inches; very pale brown (10YR 7/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; few fine and very fine roots; common fine and very fine interstitial pores; 15 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (5 to 8 inches thick)

Bw2—12 to 21 inches; very pale brown (10YR 7/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium angular blocky structure; slightly hard, friable, sticky and plastic; few fine and very fine roots; few fine and very fine interstitial pores; 20 percent pebbles; mildly alkaline (pH 7.6); abrupt smooth boundary. (9 to 12 inches thick)

Bqkm—21 to 28 inches; white (10YR 8/1) strongly silica-cemented gravelly duripan, light gray (10YR 7/2) moist; massive; extremely hard, very firm; common

fine tubular pores; strongly effervescent; moderately alkaline (pH 8.6); clear wavy boundary. (4 to 10 inches thick)

2Bqkm—28 to 60 inches; white (10YR 8/1) alternating layers of weakly and strongly silica-cemented very gravelly sand, light gray (10YR 7/2) moist; hard, firm, nonsticky and nonplastic; common fine and very fine interstitial pores; 50 percent pebbles; strongly effervescent; moderately alkaline (pH 8.6).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 44 to 47 degrees F. Depth to the duripan is 20 to 30 inches. Where mixed, the particle-size control section is loam or clay loam that is 20 to 30 percent clay and 5 to 35 percent rock fragments. The A and Bw horizons are neutral to moderately alkaline. A thin weak Bk horizon is in the lower part of the profile in some pedons.

The A horizon has chroma of 2 or 3. It has platy or granular structure.

The Bw horizon has value of 6 or 7 when dry and 3 or 4 when moist, and it has chroma of 3 or 4. It has subangular blocky or angular blocky structure.

Rutab Series

The Rutab series consists of very deep, well drained, moderately permeable soils on fan skirts. These soils formed in alluvium derived from various kinds of rock with some influence of loess and volcanic ash. Slope is 0 to 2 percent. Elevation is 6,000 to 6,600 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Rutab loam, about 30 miles northwest of Eureka, about 1,800 feet south and 900 feet west of the northeast corner of sec. 16, T. 21 N., R. 49 E.

A1—0 to 4 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; moderate thick platy structure; slightly hard, friable, nonsticky and nonplastic; few very fine roots; many fine and very fine vesicular pores; 10 percent pebbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (3 to 4 inches thick)

A2—4 to 6 inches; light yellowish brown (10YR 6/4) loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 10 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (1 to 2 inches thick)

Bw1—6 to 11 inches; yellowish brown (10YR 5/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium roots and common fine and very fine roots; common fine and very fine interstitial and tubular pores; 15 percent pebbles; mildly alkaline (pH 7.4); gradual smooth boundary. (5 to 8 inches thick)

Bw2—11 to 22 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; soft, friable, nonsticky and nonplastic; few medium roots and common fine and very fine roots; common fine and very fine interstitial and tubular pores; 35 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (4 to 11 inches thick)

C—22 to 60 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, dark brown (10YR 3/3) moist; massive; loose, nonsticky and nonplastic; few fine and very fine roots; common fine and very fine interstitial pores; 65 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0).

These soils are moist in winter and early in spring, but they are dry in June to October. The mean annual soil temperature is 45 to 47 degrees F. Thickness of A and Bw horizons ranges from 13 to 23 inches. Where mixed, the particle-size control section averages 35 to 60 percent rock fragments and 5 to 18 percent clay.

The A horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3.

The Bw1 horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 3 or 4. It is loam or gravelly loam.

The Bw2 horizon is sandy loam or loam modified with 20 to 50 percent pebbles.

The C horizon has value of 6 or 7 when dry and 3 or 4 when moist, and it has chroma of 3 or 4. It is loamy sandy or sandy loam modified with 35 to 70 percent pebbles. In some pedons it has 5 to 10 percent durinodes that are very hard, firm, and brittle.

Shagnasty Series

The Shagnasty series consists of deep, well drained, slowly permeable soils on side slopes of mountains. These soils formed in residuum and colluvium derived from rhyolite, andesite, and quartzite. Slope is 15 to 50 percent. Elevation is 6,000 to 8,000 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 50 to 80 days.

Typical pedon of a Shagnasty extremely stony loam, 15 to 50 percent slopes, in an area of Shagnasty-Softscrabble association, about 36 miles northwest of Eureka, about 2,500 feet south and 2,000 feet west of the northeast corner of sec. 36, T. 23 N., R. 48 E.

A—0 to 9 inches; grayish brown (10YR 5/2) extremely stony loam, very dark grayish brown (10YR 3/2)

moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; common fine and medium tubular pores and common fine interstitial pores; 10 percent pebbles and 5 percent cobbles; slightly acid (pH 6.2); clear smooth boundary. (3 to 12 inches thick)

Bt—9 to 12 inches; dark grayish brown (10YR 4/2) cobbly loam, dark brown (10YR 3/3) moist; moderate fine angular blocky structure; hard, firm, sticky and plastic; many very fine, fine, medium, and coarse roots; common fine and medium tubular pores and common fine interstitial pores; many moderately thick clay films on peds and lining pores; 10 percent pebbles and 20 percent cobbles; slightly acid (pH 6.2); abrupt smooth boundary. (3 to 7 inches thick)

2Bt1—12 to 23 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 4/4) moist; strong medium and coarse prismatic structure; extremely hard, very firm, very sticky and very plastic; common medium and few fine roots; few fine tubular pores; continuous thick pressure faces on peds; 5 percent cobbles; slightly acid (pH 6.2); gradual smooth boundary. (7 to 14 inches thick)

2Bt2—23 to 36 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 4/6) moist; strong medium and coarse prismatic structure; extremely hard, very firm, very sticky and very plastic; common medium and few fine roots; few fine tubular pores; continuous thick pressure faces on peds; 5 percent cobbles; slightly acid (pH 6.2); abrupt smooth boundary. (5 to 13 inches thick)

3Bt1—36 to 43 inches; light yellowish brown (10YR 6/4) cobbly silty clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure; very hard, firm, sticky and plastic; common medium and coarse roots and few fine roots; common fine tubular pores; continuous thick clay films on peds; 5 percent pebbles and 15 percent cobbles; slightly acid (pH 6.4); clear irregular boundary. (6 to 20 inches thick)

3Bt2—43 to 59 inches; yellowish brown (10YR 5/4) cobbly silty clay loam, dark yellowish brown (10YR 4/4) moist; massive; very hard, firm, sticky and plastic; common medium and coarse roots and few fine roots; common fine and medium tubular pores; many moderately thick clay films on peds and lining pores; 5 percent pebbles and 15 percent cobbles; slightly acid (pH 6.2); clear wavy boundary. (12 to 16 inches thick)

3Cr—59 inches; weathered bedrock.

These soils are moist in winter to early in summer and are dry in July to October. The mean annual soil temperature is 44 to 46 degrees F. The mollic epipedon is 10 to 16 inches thick and includes the upper part of the argillic horizon. The particle-size control section averages 35 to 50 percent clay and 5 to 15 percent rock fragments. Reaction is slightly acid to mildly alkaline. In some pedons lime is below a depth of 40 inches. In some pedons the profile does not have a lithologic discontinuity. Depth to bedrock is 50 to 60 inches.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6 when dry and 3 to 5 when moist, and chroma of 2 to 4 in the upper part and 4 to 6 in the lower part. It dominantly has prismatic or angular blocky structure, but it is massive in the lower part of some pedons.

Shipley Series

The Shipley series consists of very deep, well drained, moderately permeable soils on inset fans and fan skirts. These soils formed in alluvium derived from various kinds of rock with an influence of loess and volcanic ash. Slope is 0 to 4 percent. Elevation is 5,800 to 7,200 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of Shipley fine sandy loam, occasionally flooded, 0 to 4 percent slopes, about 17 miles west-southwest of Eureka, about 2,500 feet south and 1,100 feet west of the northeast corner of sec. 34, T. 18 N., R. 51 E.

A1—0 to 4 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; moderate thick and medium platy structure; slightly hard, friable, nonsticky and nonplastic; few medium and fine roots; many fine and very fine vesicular pores; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (3 to 4 inches thick)

A2—4 to 9 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common medium and fine roots; common fine and very fine interstitial pores; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (4 to 6 inches thick)

C1—9 to 22 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common medium, fine, and very fine roots; common fine and very fine interstitial pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (10 to 15 inches thick)

C2—22 to 41 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common medium, fine, and very fine roots; common fine and

very fine interstitial pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (14 to 20 inches thick)

2C—41 to 45 inches; very pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 45 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (4 to 10 inches thick)

3C—45 to 50 inches; very pale brown (10YR 8/3) gravelly loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine and very fine interstitial pores; 15 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 5 inches thick)

4C—50 to 60 inches; light gray (10YR 7/2) very gravelly sandy loam, pale brown (10YR 6/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; common fine and very fine interstitial pores; 40 percent pebbles; violently effervescent; moderately alkaline (pH 8.2).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 45 to 47 degrees F. Reaction is moderately alkaline or strongly alkaline. The particle-size control section is fine sandy loam; it is 8 to 18 percent clay and more than 15 percent sand that is fine or coarser. The A horizon has value of 6 when dry, and the rest of the profile has value of 6 to 8 when dry and 4 to 6 when moist. The profile has chroma of 2 or 3. Some strata below a depth of 15 inches have as much as 20 percent durinodes.

Short Creek Series

The Short Creek series consists of very deep, well drained, slowly permeable soils on side slopes of dissected fan piedmonts. These soils formed in alluvium derived from various kinds of rock. Slope is 30 to 75 percent. Elevation is 5,400 to 6,000 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Short Creek gravelly clay loam, 30 to 50 percent slopes, in an area of Short Creek association, about 26 miles south of Carlin, about 1,700 feet north and 2,400 feet west of the southeast corner of sec. 22, T. 29 N., R. 51 E.

A—0 to 4 inches; light brownish gray (10YR 6/2) gravelly clay loam, dark grayish brown (10YR 4/2) moist; moderate very thin platy structure; hard, very friable, sticky and plastic; common very fine and fine roots; many very fine and fine vesicular pores; 25 percent pebbles and 5 percent cobbles; neutral (pH 7.2); abrupt wavy boundary. (2 to 6 inches thick)

Bt1—4 to 9 inches; brown (10YR 5/3) gravelly clay, dark grayish brown (10YR 4/2) moist; strong fine prismatic structure parting to strong fine and medium subangular blocky; very hard, friable, very sticky and very plastic; common very fine and fine roots; many very fine tubular pores; continuous moderately thick clay films on ped faces and lining pores; 25 percent pebbles and 5 percent cobbles; mildly alkaline (pH 7.4); clear wavy boundary. (5 to 10 inches thick)

Bt2—9 to 14 inches; brown (10YR 5/3) very gravelly clay, dark brown (10YR 4/3) moist; moderate fine prismatic structure parting to fine and medium subangular blocky; hard, very friable, very sticky and very plastic; many very fine and fine roots and few medium roots; many very fine tubular pores; continuous moderately thick clay films on ped faces and lining pores; 35 percent pebbles and 5 percent cobbles; mildly alkaline (pH 7.6); clear wavy boundary. (5 to 8 inches thick)

Bt3—14 to 22 inches; brown (10YR 5/3) very gravelly clay, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, very friable, very sticky and very plastic; few very fine, fine, and medium roots; many very fine tubular pores; continuous thin clay films on ped faces and lining pores; 35 percent pebbles and 10 percent cobbles; moderately alkaline (pH 8.0); gradual wavy boundary. (5 to 10 inches thick)

Btk1—22 to 38 inches brown (10YR 5/3) very gravelly clay, dark brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; hard, very friable, very sticky and very plastic; few very fine roots; many very fine tubular pores; many thin clay films on ped faces and lining pores; common fine lime filaments and lime coatings on pebbles and cobbles; 45 percent pebbles and 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (16 to 25 inches thick)

Btk2—38 to 60 inches; pale brown (10YR 6/3) extremely gravelly sandy clay, dark yellowish brown (10YR 4/4) moist; massive; hard, very friable, very sticky and very plastic; common very fine tubular pores; many thin clay films bridging sand grains; common fine lime filaments; 60 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2).

These soils are usually dry; they are moist in winter and spring but are dry in mid-June to October. The mean annual soil temperature is 45 to 47 degrees F. The upper 20 inches of the argillic horizon averages 40 to 50 percent clay modified with 35 to 50 percent rock fragments, dominantly pebbles. Depth to carbonates is 22 to 34 inches. Reaction ranges from neutral in the

noncalcareous upper part of the profile to moderately alkaline or strongly alkaline in the lower part.

The A horizon has platy or granular structure.

The Bt horizon and the upper part of the Btk horizon have value of 4 or 5 when moist, and they have chroma of 2 or 3. They average 35 to 50 percent rock fragments. They have moderate to strong prismatic or subangular blocky structure. The lower part of the Btk horizon is clay, sandy clay, clay loam, or sandy clay loam modified with 60 to 75 percent rock fragments.

Silverado Series

The Silverado series consists of very deep, well drained, moderately rapidly permeable soils on fan skirts. These soils formed in alluvium derived from various kinds of rock that is high in siliceous material and influenced by volcanic ash. Slope is 0 to 15 percent. Elevation is 6,000 to 6,800 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of Silverado sandy loam, 0 to 2 percent slopes, 20 miles west of Eureka, about 300 feet west and 1,100 feet south of the northeast corner of sec. 10, T. 19 N., R. 50 E.

A1—0 to 4 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many fine and very fine interstitial pores; 5 percent pebbles; slightly acid (pH 6.2); abrupt smooth boundary. (2 to 4 inches thick)

A2—4 to 6 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; weak fine and very fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine interstitial pores; 5 percent pebbles; slightly acid (pH 6.2); clear wavy boundary. (2 to 6 inches thick)

Bw—6 to 14 inches; brownish gray (10YR 6/2) sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few fine and very fine roots; common fine and very fine interstitial pores; 5 percent pebbles; slightly acid (pH 6.2); clear wavy boundary. (6 to 10 inches thick)

Bq—14 to 26 inches; very pale brown (10YR 7/3) gravelly sandy loam, brown (10YR 5/3) moist; massive; hard, firm, nonsticky and nonplastic; few fine and very fine roots; common fine and very fine interstitial pores; weakly cemented with common very thin silica bridges and few very thin discontinuous silica laminae; 20 percent pebbles; neutral (pH 7.0); gradual wavy boundary. (8 to 13 inches thick)

Bqk—26 to 35 inches; white (10YR 8/1) gravelly sandy loam, very pale brown (10YR 7/3) moist; massive; very hard, very firm, nonsticky and nonplastic; few fine roots; common fine and very fine interstitial pores; weakly cemented with common thin discontinuous silica and lime laminae; 20 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (7 to 12 inches thick)

2Bqk—35 to 60 inches; light gray (10YR 7/2) very gravelly coarse sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; many fine and very fine interstitial pores; few strongly cemented and common weakly cemented silica and lime laminae that are discontinuous and thin; 50 percent pebbles; violently effervescent; strongly alkaline (pH 9.0).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 45 to 47 degrees F. Depth to the weakly cemented Bq horizon is 12 to 20 inches. Depth to the 2Bqk horizon is 30 to 40 inches. The particle-size control section is stratified sandy loam or gravelly sandy loam; it is 5 to 15 percent clay and 10 to 30 percent pebbles. The A and Bw horizons are slightly acid or neutral; below this the profile ranges from neutral in the upper part to strongly alkaline in the 2Bqk horizon. The A and Bw horizons have value of 5 or 6 when dry and 3 or 4 when moist, and they have chroma of 2 or 3. The Bq and Bqk horizons have value of 6 to 8 when dry and 5 to 7 when moist, and they have chroma of 1 to 3. The weakly cemented part of the Bq horizon has few to common discontinuous horizontal and vertical silica laminae, and the noncemented part has durinodes or common pendants on the rock fragments.

Simpark Series

The Simpark series consists of shallow, well drained, moderately permeable soils on side slopes of mountains. These soils formed in residuum derived from rhyolite. Slope is 15 to 50 percent. Elevation is 6,200 to 7,000 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 50 to 80 days.

Typical pedon of a Simpark very stony loam, 15 to 50 percent slopes, in an area of Akerue-Simpark-Robson association, about 30 miles west of Eureka, about 300 feet north and 200 feet west of the southeast corner of sec. 9, T. 21 N., R. 48 E.

About 50 percent of the surface is covered with rock fragments, of which 30 percent is pebbles, 10 percent is cobbles, and 10 percent is stones.

A1—0 to 2 inches; pale brown (10YR 6/3) very stony loam, brown (10YR 4/3) moist; weak medium platy structure that parts to moderate fine subangular blocky; soft, very friable, slightly sticky and slightly

plastic; few medium, common fine, and many very fine roots; many medium and fine vesicular pores and many very fine tubular pores; 30 percent pebbles, 5 percent cobbles, and 10 percent stones; mildly alkaline (pH 7.8); abrupt smooth boundary. (2 to 4 inches thick)

A2—2 to 5 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine and very fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, common fine, and many very fine roots; many fine and very fine tubular pores; 30 percent pebbles and 10 percent cobbles; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 4 inches thick)

Bt1—5 to 9 inches; brown (7.5YR 5/3) very gravelly loam, dark brown (7.5YR 4/2) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, sticky and plastic; few medium and fine roots and common very fine roots; many fine and very fine tubular pores; few thin clay films lining pores and on ped faces; 40 percent pebbles and 5 percent cobbles; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 5 inches thick)

Bt2—9 to 19 inches; brown (7.5YR 5/4) very cobbly loam, dark brown (7.5YR 4/3) moist; massive; hard, firm, sticky and plastic; few fine and very fine roots; common fine and many very fine tubular pores; common thin clay films lining pores and on ped faces; thin silica coatings on the underside of pebbles; 30 percent pebbles and 20 percent cobbles; moderately alkaline (pH 8.0); clear wavy boundary. (8 to 10 inches thick)

Bqkm—19 to 21 inches; very pale brown (10YR 7/3) indurated duripan, brown (10YR 5/3) moist; massive; extremely hard, extremely firm; violently effervescent; abrupt wavy boundary. (1 to 4 inches thick)

R—21 inches; rhyolite.

These soils are moist in winter and spring, and they are dry in mid-June to mid-October. The mean annual soil temperature is 44 to 46 degrees F. Depth to the duripan ranges from 16 to 20 inches, and depth to bedrock ranges from 20 to 23 inches. Rock fragment content in the particle-size control section ranges from 35 to 60 percent, mostly cobbles and pebbles.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3.

The Bt horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 to 4.

Singletree Series

The Singletree series consists of deep, well drained, moderately slowly permeable soils on side slopes of mountains. These soils formed in residuum and colluvium derived from volcanic rock with a considerable influence of loess that is high in content of volcanic ash. Slope is 15 to 75 percent. Elevation is 5,500 to 7,500 feet. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Singletree gravelly loam, 50 to 75 percent slopes, in an area of Ramires-Singletree association, about 17 miles east of Crescent Valley, about 500 feet north and 500 feet east of the southwest corner of sec. 7, T. 29 N., R. 51 E.

About 20 percent of the surface is covered with pebbles.

A1—0 to 6 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; common medium roots and many fine and very fine roots; few medium tubular pores and many fine and very fine tubular pores; 15 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (6 to 7 inches thick)

A2—6 to 15 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate medium and fine granular structure; soft, very friable, slightly sticky and slightly plastic; few medium roots and common fine and very fine roots; few medium tubular pores and many fine and very fine tubular pores; 10 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (9 to 11 inches thick)

Bt1—15 to 23 inches; yellowish brown (10YR 5/4) clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few medium and fine roots and common very fine roots; few medium, common fine, and many very fine tubular pores; common thin clay films lining pores and on ped faces; 10 percent pebbles; mildly alkaline (pH 7.8); gradual wavy boundary. (7 to 9 inches thick)

Bt2—23 to 35 inches; light yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine roots; few medium, common fine, and many very fine tubular pores; common thin clay films lining pores and on ped faces; 20 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (11 to 13 inches thick)

2Bk—35 to 57 inches; light yellowish brown (10YR 6/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; few fine lime seams and coatings on the underside of pebbles; 10 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (12 to 22 inches thick)

Cr—57 inches; weathered tuff.

These soils are usually dry from mid-June to early in October. The mean annual soil temperature ranges from 44 to 46 degrees F. The mollic epipedon is 15 to 18 inches thick. Depth to lime ranges from 33 to 40 inches. Depth to bedrock ranges from 45 to 60 inches.

The Bt horizon is heavy loam, gravelly loam, clay loam, or gravelly clay loam; it is 25 to 35 percent clay.

The 2Bk horizon is sandy loam, gravelly sandy loam, sandy clay loam, or gravelly sandy clay loam; it is 15 to 25 percent clay.

Singletree Variant

The Singletree Variant consists of very deep, well drained, moderately slowly permeable soils on lake plain terraces. These soils formed in alluvium derived from various kinds of rock. Slope is 0 to 2 percent. Elevation is about 7,200 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Singletree Variant fine sandy loam, 0 to 2 percent slopes, in an area of Singletree Variant-Boulder Lake association, about 8 miles west of Eureka, about 800 feet west and 1,900 feet south of the northwest corner of sec. 3, T. 18 N., R. 52 E.

A—0 to 6 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; strong thick platy structure; slightly hard, friable, nonsticky and slightly plastic; common very fine roots; many medium and fine vesicular pores; moderately alkaline (pH 8.0); abrupt smooth boundary. (5 to 7 inches thick)

Bw1—6 to 11 inches; brown (10YR 5/3) silty clay loam, dark brown (10YR 3/3) moist; strong medium subangular blocky structure; hard, firm, sticky and plastic; many fine and very fine roots; common fine and very fine interstitial pores; moderately alkaline (pH 8.0); abrupt wavy boundary. (5 to 7 inches thick)

Bw2—11 to 18 inches; yellowish brown (10YR 5/4) silty clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; very hard, firm, sticky and plastic; common very fine roots; common fine and very fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary. (5 to 10 inches thick)

Bw3—18 to 26 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure; very hard, firm, sticky and plastic; few fine and very fine roots; common fine and very fine tubular pores; common moderately thick pressure faces on peds; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (7 to 11 inches thick)

2Bk—26 to 60 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; many fine and very fine interstitial pores; common fine lime veins; 40 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2).

These soils are dry in mid-June to October, and they are moist in winter and spring. The mean annual soil temperature is 44 to 46 degrees F. The mollic epipedon is 10 to 14 inches thick. The upper part of the particle-size control section is 18 to 35 percent clay and 0 to 15 percent pebbles, and the lower part is 15 to 25 percent clay and 25 to 50 percent pebbles. The A and Bw horizons are mildly alkaline or moderately alkaline, and the rest of the profile is moderately alkaline or strongly alkaline. Depth to the 2Bk horizon is 24 to 35 inches.

The A horizon has value of 4 or 5 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. It has platy, subangular blocky, or granular structure.

The Bw horizon has value of 4 or 5 when dry and 3 or 4 when moist, and it has chroma of 3 or 4. It is loam, clay loam, silt loam, or silty clay loam. Where mixed, it is 0 to 15 percent pebbles. The horizon has subangular blocky, angular blocky, or prismatic structure. It is noneffervescent or slightly effervescent in the upper part and it is slightly effervescent or strongly effervescent in the lower part.

The 2Bk horizon has value of 6 to 8 when dry and 4 to 6 when moist, and it has chroma of 3 or 4. It is stratified gravelly loam to very gravelly sandy loam modified with 15 to 45 percent pebbles. It has common to many lime filaments and coatings on the rock fragments. It is strongly effervescent or violently effervescent.

Softscrabble Series

The Softscrabble series consists of very deep, well drained, slowly permeable soils on side slopes of mountains. These soils formed in residuum and colluvium derived from volcanic rock. Slope is 4 to 50 percent. Elevation is 6,000 to 8,200 feet. The mean annual precipitation is about 16 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 50 to 80 days.

Typical pedon of a Softscrabble stony fine sandy loam, 15 to 30 percent slopes, in an area of Chad-Gando-Softscrabble association, about 34 miles northwest of Eureka, about 1,800 feet west and 1,200 feet north of the southeast corner of sec. 20, T. 23 N., R. 50 E.

About 2 percent of the surface is covered with stones.

A1—0 to 10 inches; brown (10YR 4/3) stony fine sandy loam, dark brown (10YR 3/3) moist; moderate thick platy structure; slightly hard, friable, nonsticky and slightly plastic; many fine and very fine roots; many fine and very fine interstitial pores; 10 percent pebbles; neutral (pH 7.0); clear wavy boundary. (8 to 12 inches thick)

A2—10 to 20 inches; brown (10YR 4/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; many fine and very fine roots; many fine and very fine interstitial pores; 25 percent pebbles; neutral (pH 6.8); clear smooth boundary. (8 to 13 inches thick)

Bt1—20 to 38 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate medium angular blocky structure; hard, firm, sticky and plastic; common fine and very fine roots; many fine and very fine tubular pores; 40 percent pebbles and 5 percent cobbles; neutral (pH 7.0); clear smooth boundary. (12 to 22 inches thick)

Bt2—38 to 55 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; hard, firm, slightly sticky and plastic; few fine roots; many fine and very fine tubular pores; 35 percent pebbles and 5 percent cobbles; neutral (pH 7.0); gradual smooth boundary. (15 to 22 inches thick)

Bt3—55 to 60 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; hard, firm, sticky and plastic; few fine roots; common fine and very fine tubular pores; 40 percent pebbles; neutral (pH 7.0).

These soils are usually dry from July to early in October, but they are moist in winter and spring. The mean annual soil temperature is 44 to 47 degrees F. The mollic epipedon is 20 to 38 inches thick. The particle-size control section averages 35 to 70 percent rock fragments and 27 to 35 percent clay. Reaction is neutral to slightly acid throughout.

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4 when dry and 2 or 3 when moist, and chroma of 2 or 3. The horizon has platy, subangular blocky, or granular structure.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5 when dry and 3 or 4 when moist, and chroma of 3 or 4. It is very gravelly or extremely gravelly clay loam in the upper part and is very gravelly loam, extremely gravelly loam, or very gravelly clay loam in the lower part.

Solak Series

The Solak series consists of shallow, somewhat excessively drained, moderately permeable soils on mountains. These soils formed in residuum derived from tuff, chert, and siliceous shale. Slope is 8 to 75 percent. Elevation is 6,500 to 8,000 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Solak very gravelly loam, 30 to 75 percent slopes, in an area of Solak-Highams-Hymas association, about 14 miles south of Carlin, about 300 feet east and 2,100 feet north of the southwest corner of sec. 10, T. 27 N., R. 48 E.

A1—0 to 3 inches; light brownish gray (2.5Y 6/2) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine vesicular and tubular pores; 40 percent pebbles and 10 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 4 inches thick)

A2—3 to 5 inches; light brownish gray (2.5Y 6/2) very gravelly loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine tubular pores; 40 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (1 to 4 inches thick)

Bk—5 to 10 inches; light gray (2.5Y 7/2) very gravelly loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium roots; many very fine interstitial and tubular pores; lime coatings on the underside of pebbles; 50 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); abrupt irregular boundary. (5 to 7 inches thick)

R—10 inches; fractured siliceous shale.

These soils are usually dry; they are moist in winter and spring but are dry in mid-June to October. The mean annual soil temperature is about 45 to 47 degrees F. The depth to secondary carbonates is 4 to 8 inches. Depth to lithic contact is 10 to 14 inches. The particle-size control section averages 40 to 60 percent rock fragments, mainly pebbles.

The A horizon has value of 3 or 4 when moist, and it has chroma of 2 or 3.

The Bk horizon has hue of 2.5Y or 10YR, value of 6 or 7 when dry and 3 or 4 when moist, and chroma of 2 or 3. It is very gravelly loam modified with 35 to 60 percent pebbles.

The Solak soils in this survey area are taxadjunct to the Solak series because the A and Bk horizons have hue of 2.5Y. This difference, however, does not significantly affect use and management.

Sonoma Series

The Sonoma series consists of very deep, poorly drained, moderately slowly permeable soils on basin floor remnants. The water table in these soils is under artesian pressure. These soils formed in silty alluvium

with some influence of volcanic ash. Slope is 0 to 2 percent. Elevation is 5,600 to 5,700 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 50 degrees F. The frost-free season is 90 to 110 days.

Typical pedon of Sonoma silt loam, frequently flooded, strongly saline; about 16 miles south of Cortez, on the Gund Ranch; about 900 feet east and 400 feet south of the northwest corner of sec. 33, T. 24 N., R. 48 E.

A1—0 to 3 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; few fine and very fine tubular pores; violently effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (2 to 4 inches thick)

A2—3 to 7 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; strong medium subangular blocky structure; hard, friable, sticky and plastic; many fine and very fine roots; common very fine tubular pores; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (3 to 5 inches thick)

A3—7 to 13 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and very fine roots; common very fine tubular pores; 5 percent pebbles; violently effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (5 to 7 inches thick)

C1—13 to 25 inches; light brownish gray (2.5Y 6/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; few fine distinct yellow (2.5Y 7/6) iron mottles, olive yellow (2.5Y 6/6) moist; massive; slightly hard, friable, sticky and plastic; common fine and very fine roots; many very fine tubular pores; violently effervescent; very strongly alkaline (pH 9.2); gradual wavy boundary. (10 to 14 inches thick)

C2—25 to 60 inches; light gray (2.5Y 7/2) silt loam, grayish brown (2.5Y 5/2) moist; few fine distinct yellow (2.5Y 7/6) iron mottles, olive yellow (2.5Y 6/6) moist; massive; slightly hard, friable, sticky and plastic; few very fine roots; many very fine tubular pores; violently effervescent; very strongly alkaline (pH 9.2).

The mean annual soil temperature is 50 to 53 degrees F. These soils have a seasonal high water table at a depth of 1.5 to 3.0 feet, and they are strongly salt-affected at the surface. The particle-size control section is stratified heavy silt loam or silty clay loam that is 25 to 35 percent clay. A buried A horizon is common in some pedons.

Sonoma Variant

The Sonoma Variant consists of very deep, very poorly drained, moderately permeable soils on basin floor remnants. They have a static water table that is under artesian pressure. These soils formed in silty alluvium with some influence of loess and volcanic ash. Slope is 0 to 2 percent. Elevation is 5,600 to 5,700 feet. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 47 degrees F. The frost-free season is 90 to 110 days.

Typical pedon of Sonoma Variant silt loam; about 17 miles south of Cortez, on the Gund Ranch; about 400 feet east and 600 feet north of the southwest corner of sec. 33, T. 24 N., R. 48 E.

A—0 to 4 inches; light gray (2.5Y 7/2) silt loam, grayish brown (2.5Y 5/2) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common medium roots and many fine and very fine roots; many very fine tubular pores; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (3 to 5 inches thick)

Ag—4 to 20 inches; gray (N 6/0) silt loam, dark gray (N 4/0) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common medium roots and many fine and very fine roots; many very fine tubular pores; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (14 to 18 inches thick)

Agb—20 to 27 inches; gray (N 5/0) silt loam, black (N 2/0) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common medium roots and many fine and very fine roots; many very fine tubular pores; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (5 to 9 inches thick)

Cg—27 to 60 inches; light gray (N 7/0) silt loam, dark gray (N 4/0) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine and very fine roots; many very fine tubular pores; violently effervescent; strongly alkaline (pH 8.6).

These soils have a static water table at a depth of 0.5 to 1.5 feet. The mean annual soil temperature is 47 to 51 degrees F. Depth to the buried A horizon ranges from 17 to 23 inches.

These soils are a variant of the Sonoma series because they are less than 18 percent clay and they have chroma of 1 or less below the A horizon when moist.

Soughe Series

The Soughe series consists of shallow, well drained, moderately slowly permeable soils on hillsides. These

soils formed in residuum derived from quartzite, shale, conglomerate, tuff, and altered andesite. Slope is 15 to 50 percent. Elevation is 4,800 to 6,000 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 46 degrees F. The frost-free season is 90 to 110 days.

Typical pedon of a Soughe very gravelly loam, 15 to 50 percent slopes, in an area of Soughe-Fortank-Kodra Variant association, about 10 miles east of Crescent Valley, about 280 feet west of the southeast corner of sec. 32, T. 30 N., R. 49 E.

A1—0 to 3 inches; light brownish gray (10YR 6/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate thick and very thick platy structure; slightly hard, very friable, slightly sticky and plastic; common very fine roots; many very fine and fine vesicular and tubular pores; 40 percent pebbles; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 5 inches thick)

A2—3 to 7 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; strong thin platy structure; slightly hard, very friable, sticky and plastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine interstitial and tubular pores; 45 percent pebbles; moderately alkaline (pH 8.2); clear wavy boundary. (3 to 5 inches thick)

Bt—7 to 12 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; hard, friable, sticky and plastic; many very fine and few coarse roots; many very fine tubular pores; continuous thin clay films lining pores and common thin clay films on ped faces; 55 percent pebbles; moderately alkaline (pH 8.4); abrupt wavy boundary. (4 to 10 inches thick)

R1—12 to 17 inches; fractured quartzite; fractures are 3 to 12 inches apart.

R2—17 inches; quartzite.

These soils are usually dry; they are moist in winter and spring but are dry in mid-June to October. The mean annual soil temperature is 47 to 50 degrees F. Depth to bedrock is 10 to 20 inches. The particle-size control section is clay loam, sandy clay loam, or loam modified with 35 to 60 percent rock fragments, dominantly pebbles. Clay averages 25 to 35 percent.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist. It has weak to strong platy structure.

The Bt horizon has value of 4 to 6 when dry, and it has chroma of 3 or 4. It has weak to strong subangular blocky structure.

Soughe Variant

The Soughe Variant consists of shallow, well drained, slowly permeable soils on mountains. These soils formed in residuum derived from calcareous tuff, shale, and sandstone. Slope is 30 to 50 percent. Elevation is 6,500 to 7,500 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 42 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Soughe Variant gravelly loam, 30 to 50 percent slopes, in an area of Soughe Variant-Pie Creek-Singletree association, about 19 miles south of Crescent Valley, about 1,060 feet west and 1,850 feet north of the southeast corner of sec. 3, T. 26 N., R. 48 E.

A1—0 to 2 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and few fine vesicular pores; 15 percent pebbles and 5 percent cobbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (1 to 3 inches thick)

A2—2 to 4 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 4/3) moist; strong very thin and thin platy structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots and few medium and coarse roots; common very fine vesicular and tubular pores and few fine vesicular pores; 15 percent pebbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (2 to 3 inches thick)

Bt—4 to 12 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; very hard, firm, sticky and very plastic; few very fine and fine roots and common medium and coarse roots; common very fine tubular pores; many shiny pressure faces on peds; 20 percent pebbles; moderately alkaline (pH 8.0); clear wavy boundary. (5 to 10 inches thick)

Btk—12 to 19 inches; light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/4) gravelly clay, yellowish brown (10YR 5/6) moist; weak medium prismatic structure; very hard, friable, sticky and very plastic; few very fine, fine, and medium roots; common very fine tubular pores; 30 percent pebbles; many shiny pressure faces on peds; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (4 to 8 inches thick)

Cr—19 to 33 inches; weathered, calcareous shale.

R—33 inches; calcareous shale.

These soils are usually dry; they are moist in winter and spring but are dry in June to October. Depth to paralithic contact is 12 to 20 inches. The soil is neutral to moderately alkaline, commonly increasing in alkalinity with increasing depth.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. Where mixed and dry, the upper 7 inches has value of more than 5.5.

The A horizon has very thin to thick platy structure or fine and medium subangular blocky structure.

The Bt horizon has value of 5 or 6 when dry and 4 or 5 when moist, and it has chroma of 4 to 6. It has 40 to 55 percent clay and 20 to 35 percent rock fragments, mainly pebbles.

These soils are a variant of the Soughe series because the mean annual soil temperature is less than 47 degrees F, the argillic horizon is less than 35 percent rock fragments and more than 40 percent clay, and a paralithic contact is present.

Spinlin Series

The Spinlin series consists of moderately deep, well drained, very slowly permeable soils on mountains. These soils formed in residuum and colluvium derived from quartzite, andesite, and rhyolite. Slope is 8 to 30 percent. Elevation is 7,800 to 9,200 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 40 degrees F. The frost-free season is 50 to 70 days.

Typical pedon of a Spinlin extremely stony loam, 8 to 30 percent slopes, in an area of Winu-Spinlin association, about 30 miles northwest of Eureka, about 1,980 feet east and 1,980 feet south of the northwest corner of sec. 24, T. 23 N., R. 50 E.

About 30 percent of the surface is covered with stones.

A—0 to 10 inches; grayish brown (10YR 5/2) extremely stony loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many fine and very fine roots; many fine and very fine interstitial pores; 20 percent pebbles, 15 percent cobbles, and 10 percent stones; neutral (pH 7.2); clear wavy boundary. (10 to 12 inches thick)

Bt1—10 to 18 inches; yellowish brown (10YR 5/4) very cobbly clay, dark yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; hard, firm, very sticky and very plastic; common fine and very fine roots; common fine and very fine tubular pores; common moderately thick pressure faces on peds; 20 percent pebbles, 25 percent cobbles, and 5 percent stones; mildly alkaline (pH 7.4); gradual smooth boundary. (8 to 10 inches thick)

Bt2—18 to 25 inches; yellowish brown (10YR 5/4) very cobbly clay, dark yellowish brown (10YR 4/4) moist; strong very fine angular blocky structure; hard, firm, sticky and plastic; common fine and very fine roots; common fine and very fine tubular pores; many thick pressure faces on peds; 5 percent pebbles, 25 percent cobbles, and 10 percent stones; mildly alkaline (pH 7.6); gradual smooth boundary. (6 to 7 inches thick)

Btk—25 to 32 inches; yellowish brown (10YR 5/4) very cobbly clay, dark yellowish brown (10YR 4/4) moist; common fine angular blocky structure; slightly hard, friable, sticky and plastic; few fine roots; common fine tubular pores; common thin pressure faces on peds; few fine lime veins; 5 percent pebbles, 25 percent cobbles, and 10 percent stones; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (6 to 11 inches thick)

Cr—32 inches; weathered rhyolite.

These soils are moist in winter and spring but are dry in mid-July to October. The mean annual soil temperature is 36 to 41 degrees F, and the mean summer soil temperature is 54 to 59 degrees F. Depth to paralithic contact ranges from 30 to 40 inches. Depth to lime is 24 to 29 inches. The mollic epipedon is 10 to 12 inches thick. The argillic horizon averages 40 to 60 percent clay and 35 to 50 percent rock fragments, mainly pebbles and cobbles.

The A horizon has chroma of 2 or 3. It has granular or subangular blocky structure.

The Bt horizon has chroma of 3 or 4. It has subangular blocky, angular blocky, or prismatic structure. It is neutral or mildly alkaline in the upper part and is mildly alkaline or moderately alkaline in the lower part.

Stampede Series

The Stampede series consists of moderately deep, well drained, very slowly permeable soils on fan piedmont remnants. These soils formed in alluvium derived from various kinds of rock, primarily tuff. Slope is 4 to 15 percent. Elevation is 5,600 to 6,500 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Stampede gravelly loam, 4 to 15 percent slopes, in an area of Donna-Stampede association, east of Crescent Valley, about 6 miles south and 6 miles about 650 feet west and 500 feet north of the southeast corner of sec. 32, T. 29 N., R. 51 E.

About 5 percent of the surface is covered with cobbles.

A1—0 to 4 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine vesicular pores; 15 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (3 to 5 inches thick)

A2—4 to 9 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, very friable, sticky and plastic; many very fine and fine roots; many very fine vesicular and tubular pores; 15 percent pebbles; neutral (pH 7.2); clear wavy boundary. (3 to 7 inches thick)

AB—9 to 11 inches; light brownish gray (10YR 6/2) gravelly clay loam, dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots; many very fine tubular pores; 20 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (0 to 3 inches thick)

Bt1—11 to 16 inches; pale brown (10YR 6/3) clay, brown (10YR 4/3) moist; strong fine and medium angular blocky structure; hard, firm, very sticky and very plastic; common very fine and fine roots; common very fine tubular pores; continuous moderately thick pressure faces; continuous moderately thick clay films lining pores; 5 percent cobbles and 5 percent pebbles; mildly alkaline (pH 7.6); clear wavy boundary. (5 to 8 inches thick)

Bt2—16 to 21 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; weak fine prismatic structure parting to strong fine and medium angular blocky; very hard, firm, very sticky and very plastic; few very fine roots along ped faces; common very fine tubular pores; continuous moderately thick pressure faces; continuous moderately thick clay films lining pores; 5 percent cobbles; mildly alkaline (pH 7.8); clear wavy boundary. (3 to 6 inches thick)

Btk—21 to 26 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; hard, friable, sticky and very plastic; few very fine roots; common very fine and few fine tubular pores; many thin clay films on ped faces and lining pores; 5 percent cobbles and 5 percent pebbles; strongly effervescent; thin lime coatings on bottom of some cobbles; moderately alkaline (pH 8.4); abrupt wavy boundary. (0 to 7 inches thick)

Bqkm—26 to 32 inches; white (10YR 8/2) indurated duripan, mottled, very pale brown (10YR 7/3) and light yellowish brown (10YR 6/4) moist; massive; extremely hard, extremely firm; many very fine roots on surface of laminar cap and in fractures; strongly effervescent.

These soils are moist in winter and spring but are dry in July to October. The mean annual soil temperature ranges from 45 to 47 degrees F. Depth to the duripan is 22 to 32 inches.

The A horizon has value of 4 or 5 when dry, and it has chroma of 2 or 3. The Bt and Btk horizons have value of 5 or 6 when dry and 3 or 4 when moist, and they have chroma of 2 to 4. They have prismatic, angular blocky, or subangular blocky structures. The duripan ranges from noneffervescent to strongly effervescent.

These soils are a taxadjunct to the Stampede series because reaction is slightly higher throughout the profile and secondary carbonates coat the underside of rock fragments in the Btk horizon, which directly overlies the indurated duripan. These differences, however, do not significantly affect use and management.

Tenabo Series

The Tenabo series consists of shallow, well drained, moderately slowly permeable soils on smooth fan piedmonts. These soils formed in a thin loess mantle that is high in content of volcanic ash and overlies mixed alluvium. Slope is 0 to 4 percent. Elevation is 4,700 to 5,100 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Tenabo gravelly very fine sandy loam, 0 to 4 percent slopes, in an area of Tenabo-Ricert association, about 4 miles north of Crescent Valley, about 50 feet north and 45 feet east of the southwest corner of sec. 16, T. 30 N., R. 48 E.

About 5 percent of the surface is covered with cobbles.

A—0 to 5 inches; light brownish gray (2.5Y 6/2) gravelly very fine sandy loam, brown (10YR 4/3) moist; moderate thin and weak medium platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine vesicular pores and few very fine tubular pores; 25 percent pebbles; moderately alkaline (pH 8.2); abrupt wavy boundary. (2 to 5 inches thick)

Bt—5 to 9 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak medium prismatic structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; many very fine tubular pores; few thin clay films on ped faces and lining pores; 5 percent pebbles; moderately alkaline (pH 8.2); abrupt wavy boundary. (1 to 4 inches thick)

Btn—9 to 14 inches; yellowish brown (10YR 5/4) silty clay loam, brown (10YR 4/3) moist; moderate fine prismatic structure; slightly hard, very friable, sticky and very plastic; common very fine and fine roots; many very fine tubular pores; continuous thin clay films on ped faces and lining pores; 10 percent pebbles; strongly alkaline (pH 8.8); clear wavy boundary. (3 to 8 inches thick)

2Btnk—14 to 17 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; hard, very friable, sticky and plastic; many very fine and fine roots; many very fine tubular pores and few very fine vesicular pores; few thin clay films lining pores; 30 percent pebbles; common fine lime filaments and soft masses; violently effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (2 to 5 inches thick)

2Bqkm—17 to 31 inches; white (10YR 8/2) indurated duripan, light yellowish brown (10YR 6/4) moist; continuous thin silica laminae; massive; extremely hard, extremely firm; few very fine roots; common very fine tubular pores; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (10 to 20 inches thick)

3Cqk—31 to 46 inches; white (10YR 8/2) extremely gravelly sandy loam, light yellowish brown (10YR 6/4) moist; massive; very hard, very friable, slightly sticky and nonplastic; few very fine roots; many very fine tubular pores; discontinuous thin strongly silica-cemented laminae stratified with matrix as described above; 60 percent pebbles; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (8 to 17 inches thick)

3Ck—46 to 50 inches; variegated coarse sand and pebbles; single grain; loose, nonsticky and nonplastic; few very fine roots; strongly effervescent; strongly alkaline (pH 8.5).

These soils are usually dry; they are moist in winter and spring but are dry late in May to October. The mean annual soil temperature ranges from 48 to 50 degrees F. Depth to the duripan ranges from 15 to 20 inches. The profile is moderately alkaline or strongly alkaline. The argillic horizon contains 15 to 30 percent exchangeable sodium.

The A horizon has hue of 10YR or 2.5Y.

The Bt, Btn, and Btnk horizons have value of 5 or 6 when dry, and they have chroma of 3 or 4. They are silty clay loam or gravelly clay loam with thin strata of silt loam, and they average 5 to 20 percent pebbles.

The 3C horizon ranges from extremely gravelly coarse sand to very gravelly sandy loam. It is strongly alkaline or very strongly alkaline.

Tenvorrd Series

The Tenvorrd series consists of shallow, well drained, moderately permeable soils on fan piedmont remnants. These soils formed in alluvium derived mainly from rhyolite, basalt, and siltstone with a strong influence of loess and volcanic ash. Slope is 4 to 15 percent. Elevation is 5,100 to 6,200 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 49 degrees F. The frost-free season is 95 to 120 days.

Typical pedon of a Tenvorrd silt loam, 4 to 15 percent slopes, about 38 miles south of Carlin, in an area of Cortez-Tenvorrd association, about 500 feet south and 2,400 feet west of the northeast corner of sec. 8, T. 26 N., R. 52 E.

A1—0 to 5 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable, sticky and plastic; many very fine and fine roots; many very fine vesicular and tubular pores; mildly alkaline (pH 7.4); clear wavy boundary. (2 to 5 inches thick)

A2—5 to 9 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; massive; slightly hard, very friable, sticky and plastic; common very fine and few fine roots; common very fine tubular pores; moderately alkaline (pH 8.0); clear wavy boundary. (2 to 4 inches thick)

Bk—9 to 19 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, sticky and plastic; many very fine and fine roots and few medium roots; common very fine and few fine tubular pores; few fine lime filaments; strongly effervescent; moderately alkaline (pH 8.4); abrupt irregular boundary. (6 to 11 inches thick)

Bqkm—19 to 40 inches; white (10YR 8/2) indurated duripan, very pale brown (10YR 7/3) moist; 1- to 3-millimeter-thick continuous silica laminae capping upper surface of horizon; few fractures; few very fine roots in fractures; strongly effervescent; strongly alkaline (pH 8.6).

These soils are usually dry; they are moist in winter and spring but are dry in mid-June to October. The mean annual soil temperature is 48 to 51 degrees F. Depth to the indurated duripan is 10 to 20 inches. The particle-size control section is silt loam or loam with 18 to 25 percent clay.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. Reaction is mildly alkaline or moderately alkaline.

The Bk horizon has value of 6 or 7 when dry and 3 to 5 when moist, and it has chroma of 2 or 3. It is strongly effervescent or violently effervescent. Reaction is moderately alkaline or strongly alkaline.

The Bqkm horizon has value of 7 or 8 when dry and 6 or 7 when moist, and it has chroma of 2 or 3. The silica laminar capping is 1 to 6 millimeters thick.

Toeja Series

The Toeja series consists of deep, well drained, moderately slowly permeable soils on low hills. These soils formed in loess that is high in content of volcanic ash and is superimposed over residuum derived from tuff. Slope is 4 to 30 percent. Elevation is 5,100 to 5,300 feet. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Toeja loam, 4 to 15 percent slopes, in an area of Toeja-Puett association, about 23 miles south of Carlin, about 800 feet south and 800 feet east of the northwest corner of sec. 5, T. 29 N., R. 52 E.

A1—0 to 4 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure that parts to moderate fine

subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; few medium and common fine and very fine tubular pores; neutral (pH 7.2); abrupt smooth boundary. (2 to 4 inches thick)

A2—4 to 7 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; few medium and common fine and very fine tubular pores; neutral (pH 7.2); abrupt smooth boundary. (3 to 5 inches thick)

Bt1—7 to 15 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; many fine and very fine tubular pores; few thin clay films lining pores and on ped faces; neutral (pH 7.2); clear wavy boundary. (6 to 8 inches thick)

Bt2—15 to 23 inches; light brownish gray (2.5Y 6/2) sandy clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots; many fine and very fine tubular pores; common thin clay films lining pores and on ped faces; neutral (pH 7.2); clear wavy boundary. (7 to 14 inches thick)

Bt3—23 to 31 inches; light brownish gray (2.5Y 6/2) sandy clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; many fine and very fine tubular pores; few thin clay films lining pores and on ped faces; neutral (pH 7.2); gradual wavy boundary. (7 to 12 inches thick)

C—31 to 44 inches; light brownish gray (2.5Y 6/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; many fine and very fine tubular pores; neutral (pH 7.2); clear wavy boundary. (9 to 13 inches thick)

Cqk—44 to 56 inches; light gray (2.5Y 7/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, nonsticky and nonplastic; common very fine tubular pores; continuous weak lime and silica cementation; common fine lime veins; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (12 to 16 inches thick)

Cr—56 inches; weathered tuff.

These soils are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 45 to 47 degrees F. The mollic epipedon ranges from 11 to 17 inches thick. Depth to weathered tuff ranges from 48 to 60 inches. Depth to the Cqk horizon commonly is 43 to 54 inches.

Tomera Series

The Tomera series consists of very deep, well drained, slowly permeable soils on fan piedmonts. These soils formed in alluvium derived from mixed sedimentary rock and pyroclastic material. Slope is 2 to 8 percent. Elevation is 4,800 to 6,000 feet. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 47 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of Tomera loam, 4 to 8 percent slopes, about 7 miles south and 5 miles east of Crescent Valley, about 500 feet west of the southeast corner of sec. 8, T. 28 N., R. 49 E.

A—0 to 5 inches; light brownish gray (2.5Y 6/2) loam, dark brown (10YR 3/3) moist; weak very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine vesicular pores; 5 percent pebbles; moderately alkaline (pH 8.0); abrupt wavy boundary. (3 to 5 inches thick)

AB—5 to 10 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; weak fine and medium angular blocky structure; slightly hard, very friable, sticky and plastic; common very fine, fine, and medium roots; common very fine tubular pores; 10 percent pebbles; moderately alkaline (pH 8.2); abrupt wavy boundary. (5 to 7 inches thick)

Bt—10 to 15 inches; brown (10YR 5/3) gravelly clay, dark brown (7.5YR 4/4) moist; weak very fine prismatic structure parting to moderate medium angular blocky; hard, friable, very sticky and very plastic; few very fine and common medium roots; common very fine tubular pores; many thin clay films on ped faces and lining pores; 20 percent pebbles; moderately alkaline (pH 8.2); clear wavy boundary. (5 to 8 inches thick)

Btn—15 to 20 inches; yellowish brown (10YR 5/4) gravelly clay, brown (7.5YR 5/4) moist; few fine distinct reddish yellow (7.5YR 6/8, moist) iron mottles; strong medium prismatic structure; hard, friable, sticky and plastic; few very fine and fine roots; common very fine tubular pores; 25 percent pebbles; moderately alkaline (pH 8.2); clear wavy boundary. (5 to 8 inches thick)

Btnk—20 to 32 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate fine prismatic structure; hard, friable, sticky and plastic; few very fine and fine roots; many very fine vesicular and tubular pores; common thin clay films on ped faces and lining pores; 25 percent pebbles and 5 percent cobbles; few fine soft lime masses and coatings on pebbles and cobbles; violently effervescent; strongly alkaline (pH 8.4); clear wavy boundary. (8 to 14 inches thick)

2Bk—32 to 60 inches; light yellowish brown (10YR 6/4) very cobbly loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, sticky and plastic; few very fine and fine roots; common very fine tubular pores; 15 percent pebbles and 25 percent cobbles; few fine lime filaments; violently effervescent; strongly alkaline (pH 8.6).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 47 to 49 degrees F. Depth to the base of the Btnk horizon is 30 to 40 inches. Depth to carbonates is 18 to 28 inches. The A and Bt horizons are moderately alkaline or strongly alkaline, commonly increasing in alkalinity with increasing depth.

The A horizon has hue of 10YR or 2.5Y, value of 6 or 7 when dry and 3 or 4 when moist, and chroma of 2 or 3.

The Bt, Btn, and Btnk horizons have hue of 10YR or 7.5YR, value of 5 or 6 when dry and 4 or 5 when moist, and chroma of 3 or 4. The upper 20 inches averages 10 to 30 percent pebbles. The control section averages 40 to 50 percent clay, but thin layers of heavy clay loam are present in some pedons.

The 2Bk horizon averages 40 to 60 percent rock fragments and is very cobbly loam to very gravelly loamy sand.

Some pedons have an indurated duripan below a depth of 40 inches.

Tulase Series

The Tulase series consists of very deep, well drained, moderately permeable soils on inset fans and fan skirts. These soils formed in silty alluvium derived from various kinds of rock with some influence of loess and volcanic ash. Slope is 0 to 8 percent. Elevation is 5,000 to 6,000 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 90 to 120 days.

Typical pedon of Tulase silt loam, 2 to 8 percent slopes, about 36 miles south of Carlin, about 2,500 feet north and 2,200 feet east of the southwest corner of sec. 36, T. 27 N., R. 51 E.

A1—0 to 5 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; strong thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine and fine vesicular and tubular pores; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (4 to 10 inches thick)

C—5 to 11 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 4/3) moist; weak medium and coarse prismatic structure; hard, very friable, slightly sticky and slightly plastic; many very fine roots and common fine and medium roots; many very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.5); clear wavy boundary. (6 to 10 inches thick)

Cq—11 to 20 inches; light gray (10YR 7/2) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; common very fine tubular pores; 30 percent weak and moderately strong durinodes 10 to 25 millimeters in diameter; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (6 to 13 inches thick)

Cqk—20 to 38 inches; light gray (10YR 7/2) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular pores; about 20 percent moderately strong durinodes 10 to 25 millimeters in diameter; 10 percent discontinuous weak silica cementation; many coarse lime filaments; violently effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (9 to 18 inches thick)

Cky—38 to 58 inches; light gray (10YR 7/2) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common fine tubular pores; few fine lime filaments; common fine gypsum filaments; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (10 to 22 inches thick)

Cy—58 to 70 inches; light gray (10YR 7/2) very fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and slightly plastic; few very fine roots; common very fine tubular pores; common fine gypsum filaments; violently effervescent; moderately alkaline (pH 8.2).

These soils are usually dry; they are moist in winter and early in spring and are dry in June to October. The mean annual soil temperature ranges from 48 to 52 degrees F. Depth to the Cq horizon is 11 to 20 inches.

The A horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 2 or 3.

The Cq and Cqk horizons have 20 to 50 percent durinodes. Some pedons have as much as 30 percent discontinuous silica and lime cementation. Texture is silt loam or very fine sandy loam.

Umil Series

The Umil series consists of well drained, moderately rapidly permeable soils that are shallow to a duripan. These soils are on fan piedmonts. They formed in mixed alluvium derived mostly from igneous rock. Slope is 0 to 8 percent. Elevation is 5,800 to 7,000 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 43 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Umil loam, 2 to 8 percent slopes, in an area of Umil-Hayeston association, about 1.9 miles east and 5,000 feet south of the intersection of Roberts Creek Ranch Road and Highway 50, in projected sec. 3, T. 19 N., R. 51 E.

A—0 to 7 inches; light grayish brown (10YR 6/2) loam, dark brownish gray (10YR 4/2) moist; moderate medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; common fine vesicular pores and few fine interstitial pores; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (4 to 7 inches thick)

Bw—7 to 12 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak medium and fine subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; many fine and very fine roots; common fine and very fine interstitial pores; 20 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (5 to 7 inches thick)

Bqkm—12 to 42 inches; white (10YR 8/1) indurated duripan, pale brown (10YR 6/3) moist; massive; extremely hard, extremely firm; few fine interstitial pores; violently effervescent; strongly alkaline (pH 9.0).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is about 44 to 47 degrees F. Depth to the duripan is 10 to 14 inches. Reaction increases with increasing depth; it is moderately alkaline or strongly alkaline.

The A horizon has value of 3 or 4 when moist, and it has chroma of 2 or 3.

The Bw horizon has hue of 10YR or 7.5YR, value of 5 or 6 when dry and 3 or 4 when moist, and chroma of 2 to 4. It is loam or gravelly loam with 10 to 30 percent pebbles.

The Bqkm horizon has value of 7 or 8 when dry and 6 or 7 when moist, and it has chroma of 1 to 4. Strata or pockets of nonindurated material are very hard or extremely hard, are firm or friable, and are underlain by continuous indurated silica laminae. The horizon is moderately alkaline to very strongly alkaline.

Some areas of these soils are a taxadjunct to the Umil series because the soil temperature is slightly warmer. This difference, however, does not significantly affect use and management.

Valcrest Series

The Valcrest series consists of very deep, well drained, slowly permeable soils on fan piedmonts. These soils formed in mixed alluvium with some influence of loess. Slope is 2 to 8 percent. Elevation is 5,200 to 6,000 feet. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 47 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Valcrest loam, 2 to 8 percent slopes,in an area of Valcrest-Tomera association, about 14 miles south and 14 miles east of Crescent Valley, about 1,600 feet north and 530 feet east of the southwest corner of sec. 15, T. 27 N., R. 50 E.

A1—0 to 3 inches; light brownish gray (10YR 6/2) loam, dark brown (10YR 3/3) moist; strong very thin platy structure; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; common very fine vesicular pores; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (2 to 4 inches thick)

A2—3 to 7 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, sticky and plastic; many fine and very fine roots; common very fine tubular pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (3 to 5 inches thick)

A3—7 to 10 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 4/3) moist; weak thin and medium platy structure; slightly hard, very friable, sticky and plastic; few medium roots and many very fine and fine roots; few fine and many very fine tubular pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (2 to 4 inches thick)

Btnk1—10 to 18 inches; light yellowish brown (10YR 6/4) clay, brown (7.5YR 4/4) moist; strong medium prismatic structure parting to strong medium angular blocky; hard, friable, very sticky and very plastic; common fine and very fine roots; many very fine tubular pores; continuous thin and moderately thick clay films on ped faces and lining pores; common fine lime filaments; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (7 to 9 inches thick)

Btnk2—18 to 22 inches; light yellowish brown (10YR 6/4) clay, brown (7.5YR 4/4) moist; moderate medium prismatic structure parting to moderate fine angular blocky; hard, friable, very sticky and very plastic; few fine and very fine roots; common very fine tubular pores; many moderately thick clay films on ped faces and lining pores; many fine lime filaments; 5 percent pebbles; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (4 to 6 inches thick)

Btnk3—22 to 29 inches; very pale brown (10YR 7/3) clay loam, yellowish brown (10YR 5/4) moist; weak coarse and medium prismatic structure; hard, very friable, sticky and plastic; few fine and very fine roots; common very fine tubular pores; common thin clay films on ped faces and lining pores; many fine lime filaments; 10 percent pebbles; violently

effervescent; very strongly alkaline (pH 9.2); abrupt wavy boundary. (6 to 8 inches thick)

2Bk—29 to 60 inches; light gray (10YR 7/2) sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; few medium roots and common fine and very fine roots; common very fine tubular pores; few fine lime filaments; 10 percent pebbles; violently effervescent; very strongly alkaline (pH 9.2).

These soils are moist in winter and spring and are dry in mid-June to October. The mean annual soil temperature is 47 to 52 degrees F. Thickness of the A and Btnk horizons is 24 to 35 inches. The particle-size control section has 35 to 50 percent clay with 15 to 40 percent exchangeable sodium.

The A horizon has value of 3 or 4 when moist, and it has chroma of 2 or 3.

The Btnk horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 3 or 4. It is heavy clay loam or clay with 0 to 15 percent rock fragments, mainly pebbles.

The 2Bk horizon is sandy loam and generally is 5 to 15 percent rock fragments, but some pedons are as much as 30 percent rock fragments, mainly pebbles.

Walti Series

The Walti series consists of moderately deep, well drained, very slowly permeable soils on mountains. These soils formed in colluvium and residuum derived from rhyolite, andesite, and quartzite. Slope is 8 to 50 percent. Elevation is 6,000 to 8,200 feet. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 50 to 80 days.

Typical pedon of a Walti extremely stony loam, 8 to 30 percent slopes, in an area of Walti-Glean association, about 35 miles south of Crescent Valley, about 1,500 feet east and 2,000 feet south of the northwest corner of sec. 4, T. 23 1/2 N., R. 49 E.

About 25 percent of the surface is covered with stones.

A—0 to 5 inches; brown (10YR 4/3) extremely stony loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine interstitial pores; 25 percent pebbles and 5 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary. (5 to 11 inches thick)

Bt1—5 to 9 inches; dark brown (10YR 3/3) clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine and very fine angular blocky structure; slightly hard, friable, sticky and plastic; common medium, fine, and very fine roots; common fine tubular pores and few fine interstitial pores; common moderately thick pressure faces on peds; 5 percent pebbles; mildly alkaline (pH 7.6); abrupt smooth boundary. (4 to 7 inches thick)

Bt2—9 to 17 inches; yellowish brown (10YR 5/4) clay, dark brown (10YR 3/3) moist; strong medium angular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots; common fine and very fine tubular pores; common thick pressure faces on peds; 5 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (6 to 10 inches thick)

Bt3—17 to 22 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 4/3) moist; strong medium and fine angular blocky structure; hard, firm, sticky and plastic; few fine roots; few fine tubular pores; many thick pressure faces on peds; 15 percent pebbles and 5 percent cobbles; mildly alkaline (pH 7.8); abrupt wavy boundary. (5 to 8 inches thick)

R—22 inches; rhyolite.

These soils are usually dry; they are moist in winter and spring and are dry late in June to mid-October. The mean annual soil temperature is about 44 to 46 degrees F. The mollic epipedon is 9 to 12 inches thick, and it commonly includes the upper part of the argillic horizon. The argillic horizon has 27 to 35 percent clay in the upper part and 40 to 60 percent in the lower part. Rock fragment content ranges from 5 to 25 percent, mainly pebbles and some cobbles. Where mixed, the argillic horizon is 40 to 50 percent clay. Depth to bedrock ranges from 20 to 30 inches. Reaction is neutral or mildly alkaline throughout.

The A horizon has value of 4 or 5 when dry, and it has chroma of 2 or 3.

The Bt horizon has value of 4 or 5 when dry and 3 or 4 when moist, and it has chroma of 3 or 4. It has prismatic or angular blocky structure.

Weigle Series

The Weigle series consists of well drained, moderately permeable soils that are very shallow and shallow to an indurated duripan. These soils are on hills. They formed in residuum derived from shale and limestone. Slope is 15 to 30 percent. Elevation is 5,700 to 6,700 feet. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 45 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Weigle gravelly loam, 15 to 30 percent slopes, in an area of Weigle-Pedoli Variant association, about 48 miles south of Carlin, about 2,000 feet north and 500 feet west of the southeast corner of sec. 5, T. 25 N., R. 50 E.

A—0 to 4 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; moderate medium

platy structure; slightly hard, friable, slightly sticky and slightly plastic; many fine vesicular pores; 20 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (3 to 7 inches thick)

Bw—4 to 7 inches; yellowish brown (10YR 5/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many medium, fine, and very fine roots; common fine interstitial pores; 30 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (3 to 7 inches thick)

Bqkm—7 to 10 inches; white (10YR 8/2) indurated duripan that has fractures 6 to 10 inches apart, light gray (10YR 7/2) moist; massive; extremely hard, very firm; violently effervescent; gradual wavy boundary. (3 to 5 inches thick)

Bqk—10 to 18 inches; dark yellowish brown (10YR 4/4) extremely gravelly loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine interstitial pores; 60 percent pebbles and cobbles; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (2 to 11 inches thick)

R—18 inches; fractured shale.

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is 45 to 47 degrees F. Depth to the duripan is 6 to 14 inches. The duripan commonly has fractures 6 to 12 inches apart, but fractures are continuous in some pedons. The particle-size control section is loam or gravelly loam with 10 to 35 percent pebbles and 8 to 18 percent clay. Depth to bedrock is 15 to 20 inches. Reaction is strongly alkaline or very strongly alkaline.

The A horizon has value of 5 or 6 when dry and 4 or 5 when moist.

The Bw horizon has value of 5 or 6 when dry and 4 or 5 when moist, and it has chroma of 3 or 4. It is loam or gravelly loam.

Welch Series

The Welch series consists of very deep, poorly drained, moderately slowly permeable soils on flood plains, and inset fans and in narrow mountain drainageways. These soils formed in alluvium derived from volcanic rock. Slope is 0 to 8 percent. Elevation is 5,700 to 7,500 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 42 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of Welch loam, drained, 0 to 4 percent slopes; about 38 miles northwest of Eureka, about 2,000 feet east and 1,200 feet north of the southwest corner of sec. 6, T. 24 N., R. 49 E.

A1—0 to 13 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; moderate medium granular structure; slightly hard, friable, nonsticky and slightly plastic; many fine and very fine roots; many fine and very fine interstitial and tubular pores; 5 percent pebbles; neutral (pH 7.0); clear smooth boundary. (7 to 15 inches thick)

A2—13 to 19 inches; very dark gray (10YR 3/1) clay loam, black (10YR 2/1) moist; moderate medium angular blocky structure; slightly hard, friable, sticky and plastic; many fine and very fine roots; many fine and very fine interstitial pores and common fine and very fine tubular pores; 5 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (4 to 10 inches thick)

A3—19 to 32 inches; very dark gray (10YR 3/1) gravelly silt loam, black (10YR 2/1) moist; few fine distinct brownish yellow (10YR 6/6) iron mottles, dark yellowish brown (10YR 4/6) moist; weak fine subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and very fine roots; many fine and very fine interstitial and tubular pores; 15 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (10 to 16 inches thick)

C—32 to 37 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; common medium distinct brownish yellow (10YR 6/6) iron mottles, dark yellowish brown (10YR 4/6) moist; massive; slightly hard, friable, sticky and plastic; common fine and very fine roots; many fine and very fine interstitial pores and common fine and very fine tubular pores; neutral (pH 7.2); abrupt smooth boundary. (5 to 11 inches thick)

Ab—37 to 45 inches; dark grayish brown (10YR 4/2) gravelly silt loam, very dark grayish brown (10YR 3/2) moist; common medium distinct brownish yellow (10YR 6/6) iron mottles, dark yellowish brown (10YR 4/6) moist; massive; hard, firm, sticky and plastic; common fine and very fine roots; common fine and very fine tubular pores; 15 percent pebbles; mildly alkaline (pH 7.6); abrupt smooth boundary. (5 to 15 inches thick)

Cg—45 to 60 inches; olive gray (5Y 5/2) gravelly very fine sandy loam, dark olive gray (5Y 3/2) moist; common medium prominent brownish yellow (10YR 6/6) iron mottles, dark yellowish brown (10YR 4/6) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; common fine and very fine roots; common fine and very fine interstitial pores; 15 percent pebbles; mildly alkaline (pH 7.8).

These soils are saturated at or near the surface for at least 1 month during most years, mainly late in winter and early in spring. The mean annual soil temperature ranges from 42 to 46 degrees F. The mollic epipedon is 30 to 60 inches thick, and organic matter content decreases irregularly with increasing depth. Auried A

horizon is common. The particle-size control section is stratified very fine sandy loam to gravelly clay loam and averages 27 to 35 percent clay.

The A horizon has hue of 10YR to 5Y, value of 3 to 5 when dry and 2 or 3 when moist, and chroma of 1 or 2. It has platy, prismatic, granular, or subangular blocky structure or is massive. This horizon is slightly acid or neutral.

The C horizon, where present, has hue of 10YR or 2.5Y, value of 6 to 8 when dry and 4 or 5 when moist, and chroma of 1 or 2. It has distinct to prominent iron mottles that have a high chroma.

The Cg horizon has hue of 5Y or it is neutral. It has value of 5 to 8 when dry and 3 or 4 when moist, and it has chroma of 0, 1, or 2. This horizon is slightly acid to mildly alkaline.

Wendane Series

The Wendane series consists of very deep, somewhat poorly drained, moderately slowly permeable soils on alluvial flats. These soils formed in silty alluvium derived mostly from volcanic rock and volcanic ash. Slope is 0 to 2 percent. Elevation is 5,600 to 5,700 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of Wendane silt loam, frequently flooded, about 25 miles south of Crescent Valley, about 2,100 feet east and 2,200 feet north of the southwest corner of sec. 9, T. 25 N., R. 48 E.

A1—0 to 3 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak thick platy structure parting to moderate fine granular; soft, very friable, slightly sticky and slightly plastic; few medium, common fine, and many very fine roots; few medium tubular pores and many fine and very fine tubular pores; slightly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (2 to 4 inches thick)

A2—3 to 12 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; few medium roots and many fine and very fine roots; few medium tubular pores and many fine and very fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (5 to 9 inches thick)

C—12 to 19 inches; pink (7.5YR 7/4) silt loam, brown (7.5YR 4/4) moist; moderate medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine and common very fine roots; many fine and very fine tubular pores; strongly effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (5 to 10 inches thick)

Cqk—19 to 38 inches; very pale brown (10YR 7/3) silty clay loam, dark brown (10YR 4/3) moist; common fine distinct yellowish brown (10YR 5/6) iron mottles, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, sticky and plastic; few fine and very fine roots; few fine and common very fine tubular pores; 20 percent brittle durinodes 2 to 5 millimeters in diameter; few fine soft lime masses; strongly effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (17 to 21 inches thick)

Ck—38 to 60 inches; very pale brown (10YR 7/3) silty clay loam, dark brown (10YR 4/3) moist; common fine distinct yellowish brown (10YR 5/6) iron mottles, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, sticky and plastic; few very fine roots; few fine and common very fine roots; few fine and common very fine tubular pores; few fine soft lime masses; strongly effervescent; strongly alkaline (pH 8.6).

These soils have a seasonal high water table between depths of 2.5 and 3.5 feet. The mean annual soil temperature is about 51 degrees F. Exchangeable sodium content ranges from 25 to 40 percent, and it decreases near the water table. These soils are strongly salt-affected. Depth to the Cqk horizon is 11 to 20 inches. Mottles that have a high chroma are at a depth of 13 to 27 inches.

The A horizon is strongly alkaline or very strongly alkaline.

The C horizon is silt loam or very fine sandy loam. It is strongly alkaline or very strongly alkaline.

The Cqk and Ck horizons are silt loam, silty clay loam, or clay loam. They are moderately alkaline or strongly alkaline.

Whirlo Series

The Whirlo series consists of very deep, well drained, moderately rapidly permeable soils on fan skirts and alluvial fans. These soils formed in alluvium derived from various kinds of rock with a strong influence of loess. Slope is 2 to 8 percent. Elevation is 4,600 to 5,000 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of a Whirlo gravelly loam, 2 to 4 percent slopes, in an area of Whirlo-Creemon association, about 1 mile east of Crescent Valley, about 300 feet east and 90 feet north of the southwest corner of sec. 32, T. 30 N., R. 48 E.

About 45 percent of the surface is covered with pebbles.

A1—0 to 4 inches; light yellowish gray (10YR 6/2) gravelly loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine vesicular and tubular

pores; 30 percent pebbles; moderately alkaline (pH 8.4); abrupt wavy boundary. (2 to 6 inches thick)
A2—4 to 8 inches; light yellowish gray (10YR 6/2) gravelly loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; few very fine tubular pores; 25 percent pebbles; moderately alkaline (pH 8.4); abrupt wavy boundary. (2 to 6 inches thick)
Bw—8 to 12 inches; light yellowish gray (10YR 6/2) gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, sticky and plastic; common very fine and fine roots; few very fine tubular pores; 30 percent pebbles; moderately alkaline (pH 8.4); clear wavy boundary. (4 to 6 inches thick)
2Bk1—12 to 16 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, friable, sticky and plastic; common very fine and fine roots; few very fine tubular and interstitial pores; few fine segregated lime filaments and thin lime coatings on pebbles; 40 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (4 to 14 inches thick)
2Bk2—16 to 26 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, friable, sticky and plastic; common very fine and fine roots; many very fine tubular pores; common fine lime filaments and thin lime coatings on pebbles; 50 percent pebbles; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (8 to 14 inches thick)
3Bk—26 to 60 inches; variegated extremely gravelly sandy loam; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; lime coatings on pebbles and cobbles; 65 percent pebbles and 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4).

These soils are usually dry; they are moist in winter and spring but are dry in June to October. The mean annual soil temperature is about 49 to 52 degrees F. Depth to the 2Bk horizon is 10 to 18 inches. The upper part of the particle-size control section is loam or fine sandy loam modified with an average of 35 to 50 percent pebbles. The lower part of the particle-size control section is dominantly sandy loam modified with 50 to 70 percent rock fragments, mainly pebbles and some cobbles; however, in some pedons it includes very gravelly coarse sandy loam. The profile is noneffervescent in the A and Bw horizons and is strongly effervescent or violently effervescent below. Reaction is moderately alkaline in the A and Bw horizons and is moderately alkaline or strongly alkaline in the 2Bk and 3Bk horizons.

Whitepeak Series

The Whitepeak series consists of moderately deep, well drained, slowly permeable soils on mountain crests and upper side slopes. These soils formed in residuum and colluvium derived from quartzite, andesite, and rhyolite. Slope is 2 to 30 percent. Elevation is 6,400 to 7,500 feet. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Whitepeak very stony loam, 8 to 15 percent slopes, in an area of Freznik-Whitepeak association, about 14 miles south and 6 miles east of Crescent Valley, about 2,600 feet west and 2,600 feet south of the northeast corner of sec. 20, T. 27 N., R. 49 E.

About 10 percent of the surface is covered with stones.

A—0 to 3 inches; pale brown (10YR 6/3) very stony loam, dark brown (10YR 3/3) moist; weak very thin platy structure; hard, very friable, sticky and plastic; many very fine roots; many very fine tubular and vesicular pores; 15 percent stones, 5 percent cobbles, and 15 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (3 to 6 inches thick)
Bt1—3 to 6 inches; pale brown (10YR 6/3) cobbly clay loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; hard, very friable, sticky and plastic; common very fine and few fine roots; many very fine tubular and interstitial pores; common thin clay films lining pores; 5 percent stones and 15 percent cobbles; neutral (pH 7.0); abrupt wavy boundary. (3 to 6 inches thick)
Bt2—6 to 13 inches; brown (10YR 5/3) very cobbly clay, dark brown (10YR 3/3) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; hard, friable, very sticky and very plastic; common very fine and few fine roots; many very fine tubular pores; continuous moderately thick clay films on peds and lining pores; 40 percent cobbles and 15 percent pebbles; neutral (pH 7.2); clear wavy boundary. (6 to 12 inches thick)
Bt3—13 to 23 inches; yellowish brown (10YR 5/4) extremely stony clay, dark yellowish brown (10YR 3/4) moist; moderate medium prismatic structure; very hard, firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; continuous thick pressure faces on peds and continuous thick clay films lining pores; 60 percent stones and 10 percent pebbles; neutral (pH 7.0); abrupt irregular boundary. (6 to 16 inches thick)
R—23 inches; quartzite.

These soils are usually dry; they are moist in winter and spring but are dry in mid-June to October. The annual soil temperature is 44 to 46 degrees F. The depth

to bedrock is 20 to 40 inches. Where mixed, the control section averages 50 to 60 percent clay and 50 to 70 percent rock fragments. Reaction is neutral or mildly alkaline.

The A horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. It has platy or granular structure.

The Bt horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 3 or 4. It has prismatic, angular blocky, or subangular blocky structure.

Wholan Series

The Wholan series consists of very deep, well drained, moderately permeable soils on inset fans and fan skirts. These soils formed in a silty loess mantle overlying silty alluvium derived from various kinds of rock. Slope is 0 to 2 percent. Elevation is 6,000 to 6,400 feet. The mean annual precipitation is about 7 inches, and the mean annual temperature is 49 degrees F. The frost-free season is 80 to 100 days.

Typical pedon of a Wholan silt loam, cool, occasionally flooded, in an area of Wholan-Clowfin association, about 12 miles south of Eureka, about 700 feet west and 1,300 feet north of the southeast corner of sec. 17, T. 17 N., R. 54 E.

A—0 to 3 inches; light brownish gray (10YR 6/2) silt loam, brown (10YR 5/3) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and slightly plastic; few medium and fine roots; many very fine vesicular pores; slightly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (3 to 6 inches thick)

Bw—3 to 11 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine interstitial pores; strongly alkaline (pH 8.6); clear smooth boundary. (8 to 13 inches thick)

Bk—11 to 22 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine interstitial pores; common fine lime veins; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (10 to 15 inches thick)

C—22 to 60 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; few fine and very fine interstitial and tubular pores; strongly effervescent; moderately alkaline (pH 8.2).

These soils are usually dry; they are moist in winter and spring but are dry late in May to October. The mean annual soil temperature is 51 to 53 degrees F. Depth to the Bk horizon ranges from 11 to 19 inches. Reaction is mildly alkaline to strongly alkaline. The particle-size control section commonly is silt loam but ranges to very fine sandy loam. It ranges from 5 to 15 percent clay and is less than 15 percent sand that is fine or coarser. These soils commonly are slightly salt- and sodium-affected to a depth of at least 30 inches and are moderately affected below this depth.

The soils have value of 6 or 7 when dry and 4 or 5 when moist, and they have chroma of 2 to 4.

The A horizon has platy or subangular blocky structure or is massive. It is noneffervescent or slightly effervescent.

The Bw horizon has subangular blocky or prismatic structure or is massive.

The Bk horizon has few to many, fine or medium veins of secondary carbonates. Thin strata containing as much as 5 percent very hard, firm, brittle durinodes 0.5 to 0.75 inch in diameter are in the Bk horizon in some pedons.

Winu Series

The Winu series consists of moderately deep, well drained, moderately slowly permeable soils on side slopes of mountains. These soils formed in colluvium and residuum derived from mixed volcanic rock. Slope is 15 to 50 percent. Elevation is 7,500 to 9,500 feet. The mean annual precipitation is about 17 inches, and the mean annual temperature is about 42 degrees F. The frost-free season is 45 to 70 days.

Typical pedon of a Winu gravelly loam, 15 to 30 percent slopes, in an area of Labshaft-Winu association, about 6 miles south of Eureka, about 2,300 feet south and 250 feet east of the northwest corner of sec. 24, T. 18 N., R. 53 E.

A—0 to 8 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate very fine granular structure; soft, friable, sticky and plastic; many fine and very fine roots; many very fine interstitial and many fine tubular pores; 20 percent pebbles; neutral (pH 7.0); gradual smooth boundary. (8 to 12 inches thick)

Bt1—8 to 16 inches; grayish brown (10YR 5/2) gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium and fine angular blocky structure; hard, firm, sticky and plastic; few medium roots and common fine and very fine roots; common very fine interstitial pores and many fine and very fine tubular pores; common thin clay films on ped faces; 25 percent pebbles; neutral (pH 7.2); clear smooth boundary. (8 to 10 inches thick)

Bt2—16 to 22 inches; brown (10YR 4/3) gravelly clay loam, dark brown (10YR 3/3) moist; moderate coarse and medium angular blocky structure; hard, firm, sticky and plastic; few medium roots and common fine and very fine roots; common very fine interstitial pores and many fine and very fine tubular

pores; common moderately thick clay films on ped faces; 25 percent pebbles; neutral (pH 7.2); clear wavy boundary. (6 to 8 inches thick)

Bt3—22 to 32 inches; grayish brown (10YR 5/2) gravelly clay loam, dark grayish brown (10YR 4/2) moist; moderate coarse and medium angular blocky structure; hard, firm, sticky and plastic; common fine and very fine roots; common fine and very fine tubular pores; few thin pressure faces on peds; 20 percent pebbles and 5 percent cobbles; neutral (pH 7.2); abrupt wavy boundary. (3 to 10 inches thick)

R—32 inches; andesite.

These soils are moist in winter and are dry in July to October. The mean annual soil temperature is 42 to 47 degrees F, and the mean summer soil temperature is 58 to 59 degrees. Depth to bedrock is 24 to 40 inches. The mollic epipedon is 22 to 30 inches thick. The upper 20 inches of the argillic horizon has 20 to 30 percent clay and 15 to 35 percent rock fragments, mainly pebbles. The soils are slightly acid or neutral.

The A horizon has value of 3 or 4 when dry, and it has chroma of 1 or 2. It has granular or subangular blocky structure.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5 when dry and 2 to 4 when moist, and chroma of 2 or 3. It is gravelly loam, gravelly clay loam, or gravelly sandy clay loam. It has subangular blocky or angular blocky structure.

Zineb Series

The Zineb series consists of very deep, well drained, moderately rapidly permeable over rapidly permeable soils on fan aprons and fan skirts. These soils formed in alluvium derived mainly from basalt and rhyolite. Slope is 2 to 8 percent. Elevation is 4,700 to 5,300 feet. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 48 degrees F. The frost-free season is 100 to 120 days.

Typical pedon of Zineb gravelly loam, 2 to 8 percent slopes, about 4 miles south and 10 miles east of Crescent Valley, 1,500 feet west and about 100 feet north of the southeast corner of sec. 24, T. 29 N., R. 49 E.

A1—0 to 2 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate thin and medium platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine vesicular and tubular pores; 15 percent pebbles; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 4 inches thick)

A2—2 to 6 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium and thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine and few fine tubular pores; 20 percent pebbles; moderately alkaline (pH 8.2); abrupt wavy boundary. (2 to 5 inches thick)

Bw—6 to 13 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots and few fine and medium roots; common very fine tubular pores; 30 percent pebbles; moderately alkaline (pH 8.2); clear wavy boundary. (6 to 9 inches thick)

Bq—13 to 19 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 20 percent strong durinodes 5 to 25 millimeters in diameter; 25 percent discontinuous weak silica cementation; 50 percent pebbles; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 8 inches thick)

2Bk1—19 to 27 inches; pale brown (10YR 6/3) extremely cobbly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and slightly plastic; common very fine and few fine roots; common very fine tubular pores; 50 percent cobbles and 35 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (7 to 12 inches thick)

2Bk2—27 to 68 inches; variegated extremely cobbly coarse sand; single grain; loose, nonsticky and nonplastic; few very fine roots; thin silica laminae on a few pebbles; moderately thick lime coatings on the underside of a few pebbles; few very weakly cemented horizontal lime veins 1 to 5 millimeters thick; 40 percent cobbles and 45 percent pebbles; violently effervescent; strongly alkaline (pH 9.0).

These soils are usually dry in June to October. The mean annual soil temperature ranges from 47 to 49 degrees F. The particle-size control section averages 50 to 75 percent rock fragments. Reaction is moderately alkaline or strongly alkaline, increasing in alkalinity with increasing depth. Depth to carbonates and to the 2Bk horizon is 16 to 26 inches. Depth to the Bq horizon is 10 to 18 inches.

The A horizon has value of 5 or 6 when dry, and it has chroma of 2 or 3.

The Bw horizon has value of 3 or 4 when moist, and it has chroma of 3 or 4. It has subangular blocky structure or is massive. It is loam or very fine sandy loam modified with 15 to 35 percent rock fragments.

The Bq horizon is loam or sandy loam with 35 to 60 percent rock fragments, dominantly pebbles.

The 2Bk horizon has 60 to 85 percent rock fragments, dominantly cobbles.

Ziram Series

The Ziram series consists of deep, well drained, very slowly permeable soils on side slopes of mountains. These soils formed in residuum and colluvium derived from tuff, tuffaceous sandstone, quartzite, and quartz latite. Slope is 15 to 50 percent. Elevation is 6,500 to 8,100 feet. The mean annual precipitation is about 13 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 70 to 100 days.

Typical pedon of a Ziram very cobbly clay loam, 30 to 50 percent slopes, in an area of Ebic-Ziram-Jivas association, steep; about 15 miles south and 10 miles east of Crescent Valley, about 1,000 feet south and 100 feet west of the northeast corner of sec. 25, T. 27 N., R. 48 E.

About 35 percent of the surface is covered with cobbles and 35 percent is covered with pebbles.

A1—0 to 3 inches; grayish brown (10YR 5/2) very cobbly clay loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure; hard, very friable, sticky and plastic; many very fine roots; many very fine vesicular pores; 20 percent pebbles and 25 percent cobbles; mildly alkaline (pH 7.4); abrupt wavy boundary. (2 to 4 inches thick)

A2—3 to 7 inches; grayish brown (10YR 5/2) gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine granular structure; hard, very friable, sticky and plastic; common very fine and fine roots and few medium roots; many very fine interstitial pores; 30 percent pebbles; mildly alkaline (pH 7.4); abrupt wavy boundary. (4 to 7 inches thick)

Bt1—7 to 10 inches; light brownish gray (10YR 6/2) gravelly clay, dark brown (10YR 3/3) moist; moderate medium prismatic structure; very hard, very friable, very sticky and very plastic; common very fine and fine roots and few medium roots; common very fine tubular pores; continuous moderately thick clay films lining pores and on ped faces; 25 percent pebbles; moderately alkaline (pH 8.0); clear wavy boundary. (2 to 5 inches thick)

Bt2—10 to 18 inches; brown (10YR 5/3) very gravelly clay, dark brown (10YR 3/3) moist; moderate medium prismatic structure; hard, friable, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; continuous moderately thick clay films lining pores and on ped faces; 30 percent pebbles and 5 percent cobbles; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 11 inches thick)

Btk1—18 to 23 inches; yellowish brown (10YR 5/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; very hard, friable, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; continuous moderately thick pressure faces; few fine lime filaments; 40 percent pebbles and 15 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (3 to 8 inches thick)

Btk2—23 to 38 inches; yellowish brown (10YR 5/6) extremely cobbly clay, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure; hard, firm, very sticky and very plastic; few very fine, fine, and medium roots; few very fine tubular pores; continuous moderately thick pressure faces; common fine and medium lime filaments; 40 percent pebbles, 30 percent cobbles, and 5 percent stones; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (8 to 19 inches thick)

Btk3—38 to 42 inches; brownish yellow (10YR 6/6) and yellowish red (5YR 4/6) extremely cobbly clay, dark yellowish brown (10YR 4/6) and dark reddish brown (5YR 3/4) moist; weak medium angular blocky structure; hard, friable, very sticky and very plastic; few very fine tubular pores; continuous moderately thick pressure faces; common fine lime filaments; 15 percent pebbles, 50 percent cobbles, and 5 percent stones; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (3 to 6 inches thick)

R—42 inches; tuffaceous sandstone.

These soils are dry in mid-July to October but are moist in winter and spring. The mean annual soil temperature is 44 to 46 degrees F. The mollic epipedon is 7 to 11 inches thick. Depth to bedrock is 40 to 60 inches. Where mixed, the upper 20 inches of the argillic horizon averages 45 to 55 percent clay and 40 to 55 percent pebbles and cobbles. Reaction is mildly alkaline or moderately alkaline, increasing in alkalinity with increasing depth.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist. It has granular or platy structure.

The Bt horizon dominantly has hue of 10YR, but in some pedons it is mixed with hue of 5YR in the lower part. The horizon has value of 4 to 6 when dry and 3 or 4 when moist, and it has chroma of 2 to 6 when dry and 3 to 6 when moist. It is very gravelly clay, very cobbly clay, or extremely cobbly clay with a thin layer of gravelly clay in the upper part in most pedons.

Formation of the Soils

Soil is a natural body on the Earth's surface in which plants grow. It is a mixture of varying proportions of rock, minerals, organic matter, water, and air. The rock and minerals are fragmented and are partly or wholly weathered. Soils have distinctive layers, or horizons, that are the product of environmental forces acting upon material deposited or accumulated through geologic activity.

Soils differ from one another in different localities and within short distances. The differences are the result of the interaction of five soil-forming factors that are known to affect soil formation. These factors are (1) climate, mainly the temperature and kind and amount of precipitation that have existed since accumulation of the parent material; (2) relief, mainly as it affects the internal and external soil properties such as drainage, aeration, susceptibility to erosion, and exposure to sun and wind; (3) biological forces, mainly the plant cover and the organisms living in and on the soil; (4) parent material, including texture and structure of the material as well as its mineralogic and chemical composition; and (5) the length of time that the soil-forming factors have been operating.

In general, the landscape of the area is comprised mainly of mountains and valleys that are the result of geologic, stratigraphic, and structural control. The present topography and landforms, however, are primarily the result of events during Quaternary time. The kinds of soil that formed are indicative of the stability and age of the surfaces of the landforms on which they occur.

Climate

The climate of the survey area is characterized by warm, dry summers and cool, moist winters. The average annual precipitation ranges from about 6 inches at the lowest elevations, in Crescent and Grass Valleys, to about 16 inches or more at the highest elevations, in the Cortez Mountains, to the north; the Roberts Mountains, in the central part of the area; and the Fish Creek Range, to the south. The average annual air temperature ranges from about 50 degrees at the lower elevations to about 41 degrees or lower at the higher elevations. Major climatic variations are the result of the effects of topography and relief. Temperature decreases as elevation increases. Precipitation increases as elevation increases and is highest in the mountainous areas. As a consequence, the soils in the survey area reflect a general zonation with respect to elevation and longitudinal location.

At elevations of 4,800 to 5,700 feet, the average annual precipitation is about 5 to 8 inches. In this arid part of the survey area, weathering of parent material is slow, leaching is incomplete, and eluviation and illuviation proceed at a very slow rate. The plant cover is sparse and consists mainly of drought- and salt-tolerant shrubs. Typically, the soils are low in organic matter content and have a thin, light-colored A horizon. Soluble salts and calcium carbonate accumulate in the soil profile at a relatively shallow depth. Soils of the Ricert series (Duric Natrargids), the Creemon series (Duric Camborthids), and the Bubus series (Durorthidic Torriorthents) characterize those in this climatic zone.

As elevation increases there is an accompanying increase in precipitation, which results in deeper leaching of salts and calcium carbonate, lower reaction, changes in the kind and density of vegetation, and a thicker and darker colored A horizon. Soils of the Rubyhill series (Haploxerollic Durorthids)and the Enko, Zineb, and Silverado series (Durixerollic Camborthids) characterize those that formed at the lower elevations where precipitation is about 10 inches. Soils of the Hodedo series (Aridic Durixerolls) and the Donna series (Abruptic Aridic Durixerolls) are examples of those that formed at intermediate elevations.

At the highest elevations, as much as about 10,000 feet, precipitation is 12 inches to more than 16 inches. Leaching of salts and carbonates is more intensive in the soils in these areas. These soils are neutral or slightly acid and have a thick A horizon that is high in organic matter content. Soils of the Glean series (Pachic Haploxerolls), the Hapgood series (Pachic Cryoborolls), and the Winu series (Argic Pachic Cryoborolls) characterize those in this climatic zone.

In winter, freezing and thawing generally occur throughout the survey area, except in those areas that generally are insulated by snow cover. The effects of frost action are discernible by the heaving of plants, development of miniature stone rings, and erosion of the upper layer. At some of the higher elevations, freezing and thawing have fractured and displaced the bedrock.

Relief

Relief, through its effects on drainage, runoff, erosion, and exposure to the sun and wind, has had an important effect on soil formation in the survey area. The mountains, valleys, and flood plains reflect the gross variations in relief within the area.

The mountains are mainly characterized by excessive relief. Runoff is rapid or very rapid, and the hazard of erosion is high. The removal of material by erosion slows or prevents soil development. Development in soils on unstable mountain surfaces that are subject to a high rate of geologic erosion is primarily limited to accumulation of organic matter to form a dark-colored A horizon. A cambic or argillic horizon has formed in the soils on more stable mountain surfaces, where the rate of geologic erosion has been slower. Soils of the Soughe series (Lithic Xerollic Haplargids) and the Singletree series (Aridic Calcic Argixerolls) are examples of those that formed on the more stable mountainsides and have an argillic horizon. Soils of the Ansping series (Aridic Calcixerolls) are examples of those that have a calcic horizon. Soils of the Gando series (Lithic Haploxerolls) are examples of those on less stable mountainsides, where soil formation has been unable to act on parent material long enough for a calcic or argillic horizon to develop.

Soils on concave, north-facing mountainsides commonly have snow pockets that remain until late in spring or early in summer. The effect of temperature and moisture is enhanced in these areas, which results in the growth of dense stands of shrubs and grass. The soils in these areas have a thick, dark-colored A horizon with a high content of organic matter. Soils of the Glean series (Pachic Haploxerolls) are examples.

The valleys are essentially either semibolsons or bolsons that receive drainage water primarily from the surrounding mountains. Within the survey area, the valleys are characterized by a series of level or nearly level basin floors bordered by a piedmont slope consisting of alluvial fans, fan skirts, and fan piedmonts *(14)*. They consist of Tertiary-Quaternary valley fill material. Small playas or intermittent lakes are located in Crescent, Grass, and Fish Creek Valleys and on Bean Flat.

In the Pine, Garden, Kobeh, and Antelope Valley areas, stream erosion has dissected parts of the valley fill. Downcutting of the valleys has been interrupted several times, and these events are marked by the development of fan piedmonts. The dissection patterns in some of these areas have resulted in fan piedmont remnants with inset fans and flood plains along drainageways. The fan piedmont areas have been relatively stable over a long period of time as a result of the bypassing of drainage water from hills and mountains through dissecting channels. Soils of the Tenvorrd series (Xerollic Durorthids), the Tomera and Valcrest series (Xerollic Natrargids), and the Ruby, Molion, and Barrier series (Haploxerollic Durorthids) are examples of soils on stable fan piedmonts. Soils of the Enko and Cluro series (Durixerollic Camborthids) and the drained Cumulic Haplaquolls are examples of soils on inset fans and flood plains.

Adjacent to Pine Valley are low hills bordering the mountains. The hills are strongly dissected and consist of low hill crests and side slopes separated by inset fans. Soils of the Perwick and Puett series (Xeric Torriorthents) are examples of soils on the low hills, and soils of the Tulase series (Durorthidic Xeric Torriorthents) are examples of soils on the inset fans.

The level and nearly level lake plains and alluvial flats in Crescent, Grass, and Fish Creek Valleys and on Bean Flat are remnants of Pleistocene lakes or are terminal points of drainageways. Runoff is slow, and drainage is somewhat restricted. The soils in these areas are light colored and contain soluble salts. Soils of the Ocala and Dianev series (Aeric Halaquepts) and the Batan series (Durorthidic Torriorthents) are examples of soils that formed in these areas.

The soils on the nearly level axial-stream flood plains along Pine Creek in Pine Valley and Denay Creek in Denay Valley have a high water table. Runoff is very slow, and some of the soils are subject to flooding. The soils in these areas support dense stands of meadow vegetation that has contributed a large amount of organic matter to the soils, producing a dark-colored A horizon. Soils of the Welch series (Cumulic Haplaquolls) and the Humboldt series (Fluvaquentic Haplaquolls) are examples of these soils. In some areas where stream channel entrenchment is common, the water table is at a greater depth. The soils in these areas support good stands of irrigated meadow vegetation. These soils also have a dark-colored A horizon. The drained soils of the Welch series (Cumulic Haplaquolls) are examples of soils on flood plains where channel entrenchment is common; these soils are along Coils Creek in Kobeh Valley.

Biological Forces

Plants, animals, insects, and microflora are important biological forces that affect soil formation in the survey area. Animals, such as badgers and ground squirrels, and insects, such as cicadas, have had some effect on soil development, although plants appear to have had the major biological influence on the soils in this survey area.

The vegetation in the area has been a particularly important factor in reducing erosion. It has helped to maintain the stability of the land surfaces so that normal soil formation could take place.

Because of climatic differences, plants vary considerably in kinds and amounts with differences in elevation. On alluvial flats, lake plains, and fan

piedmonts at low elevations, the main plants are drought- and salt-tolerant shrubs and grasses. Because of the scarcity of available moisture, plants cover only a small part of the surface; therefore, very little organic matter is added to the soil and there is very little protection from the wind and sun. This situation is common on the Wendane soils (Aeric Halaquepts) and the Bubus soils (Durorthidic Torriorthents). Salt-tolerant shrubs also tend to recycle salts from the deeper layers to the upper layer.

On flood plains where drainage is restricted, the dense growth of meadow vegetation has supplied the organic matter that gives the Welch soils (Cumulic Haplaquolls) and Humboldt soils (Fluvaquentic Haplaquolls) a thick, dark-colored A horizon.

The piedmonts and low hills at higher elevations support a plant cover of shrubs and grasses that is transitional from desert shrubs. The density of plants is somewhat greater, soluble salts are deeper in the soil profile, and the A horizon of these soils has accumulated slight to moderate amounts of organic matter, depending on soil stability. Soils of the Cherry Spring series (Haploxerollic Durargids) and the Soughe series (Lithic Xerollic Haplargids) are typical of those on piedmonts and low hills.

The mountainous areas support denser stands of shrubs, grasses, and, in some places, trees. Because of the more abundant vegetation in these areas, the A horizon of most of the soils, such as those of the Softscrabble series (Pachic Argixerolls), is thick, high in organic matter content, and dark in color.

Parent Material

Parent material is the weathered rock or unconsolidated material from which soils form. The hardness, grain size, and porosity of the parent material and its mineralogic and chemical composition greatly influence soil formation. The main sources of parent material in the survey area are intrusive and extrusive igneous rock, sedimentary rock, colluvium, alluvium, lacustrine sediment, and eolian material, including loess and volcanic ash. Minor amounts of metasedimentary and metavolcanic rocks are common in some areas.

The igneous rock of the Simpson Park Mountains and the southern part of the Cortez Mountains includes basalt, andesite, rhyolite, and granitic rock. Volcanic rock contains appreciable quantities of minerals that weather to clay. The more siliceous rock, particularly tuff, is also a source of silica for the cementation of soil horizons. Because material derived from volcanic rock can produce clay upon weathering, most soils that formed in this material that are on sufficiently stable landforms for long periods of time have developed an argillic horizon. Soils of the Jivas series (Aridic Argixerolls), Cleavage series (Lithic Argixerolls), Simpark series (Xerollic Durargids), and Soughe series (Lithic Xerollic Haplargids) are examples.

Colluvium has accumulated on steep mountainsides as a result of gravitational forces. The colluvium generally is poorly sorted, contains many rock fragments, and includes minerals that weather to clay. Many of the colluvial landscapes have not been stable long enough for an argillic horizon to have formed in soils such as the those of the Duff and Hackwood series (Pachic Cryoborolls).

Paleozoic and mesozoic sedimentary and metasedimentary rock occurs primarily in the Cortez Mountains, Sulphur Springs Range, Roberts Mountains, and Fish Creek Range. This bedrock consists of relatively thick sequences of chert, shale, siltstone, sandstone, quartzite, conglomerate, and limestone. Soils of the Cavehill series (Typic Calcixerolls) are an example of soils in which a calcic horizon has developed. Soils of the Hopeka, Solak, and Highams series (Lithic Xeric Torriorthents) are examples of shallow, undeveloped soils on unstable land surfaces. An argillic horizon has not formed in these soils.

Late Tertiary and early Quaternary sedimentary and metasedimentary rock occurs primarily in Pine and Garden Valleys, adjacent to the mountains. The bedrock consists primarily of older alluvium and lakebed deposits containing interbedded tuffaceous shale, tuffaceous sandstone, siltstone, and mudstone. Soils of the Puett and Perwick series (Xeric Torriorthents) are examples of shallow and moderately deep, undeveloped soils on unstable surfaces.

Alluvium deposited as fan piedmonts, inset fans, fan aprons, fan skirts, alluvial fans, alluvial flats, and flood plains consists of sandy, loamy, and clayey material of generally mixed mineralogy that has been eroded from surrounding hills and mountains.

Alluvium derived from various kinds of rock on fan piedmonts, alluvial fans, fan aprons, and fan skirts is mostly loamy and silty material and generally contains pebbles, cobbles, and stones. It is porous and contains minerals that when weathered produce clay and soluble silica for cementation of duripans. Soils of the Alley series (Durixerollic Haplargids) and the Tenabo series (Typic Nadurargids) are examples of soils that have an argillic horizon and silica cementation and that formed on stable fan piedmonts. Soils of the Whirlo series (Typic Camborthids) are examples of soils that have a cambic horizon and that formed on alluvial fans. Soils of the Zineb series (Durixerollic Camborthids) are examples of soils that have a cambic horizon and some silica cementation and are on fan aprons and fan skirts.

Alluvium deposited below the fan piedmonts as fan skirts, alluvial flats, and flood plains consists of sandy, silty, and clayey material. Soluble salts are common in some of the soils in these areas. Although these materials contain weatherable minerals, the soils are young and do not exhibit soil development. Soils of the

Dianev, Ocala, and Beanflat series (Aeric Halaquepts) and the Humboldt series (Fluvaquentic Haplaquolls) are examples.

Volcanic ash and eolian material, presumably from the Mount Mazama ash falls, have been instrumental as sources of silica in the formation of durinodes and duripans in the soils in the area. Deposits of volcanic ash from the Mazama ash fall have been preserved in some of the soils in the area on fan skirts, inset fans, and alluvial flats and adjacent flood plains, such as those in the Pine Creek area. These deposits occur as thin strata. Soils of the Broyles series (Duric Camborthids) on fans skirts, the Tulase series (Durorthidic Xeric Torriorthents) on inset fans, and the Ocala series (Aeric Halaquepts) on alluvial flats are examples.

Time

Time is required for the formation of soil horizons. The amount of time required depends upon the other soil-forming factors. Thickness and other characteristics of the A and B horizons and other horizons reflect the relative age of soils. The age or strength of expression of the soil horizons is a reflection of the amount of weathering of parent material resulting from the interaction of moisture, temperature, and biological activity as influenced by time.

The soils in this survey area range from a few years to possibly a few hundred thousand years or more in age. This range in age is a major reason for the many kinds of soil in the area.

The influence of time and other soil-forming factors is not well understood by soil scientists and geologists working in this field. Many feel that weathering of parent material and soil profile development have been essentially continuous, with little change in rate throughout Quaternary time *(12, 13, 16, 21)*.

Recently, geologists concerned with differentiating among Quarternary deposits have proposed that soil development has not proceeded continuously at the same rate but has taken place intermittently at rapid rates *(9, 10, 11, 15)*. These geologists have developed the technique of mapping soil stratigraphic units that use weathering profiles as stratigraphic markers to differentiate among and correlate Quaternary deposits. The concept of soil development is based on the assumption that weathering profiles formed in response to infrequent combinations of climatic factors that induced minimal erosion and deposition and a greatly accelerated rate of chemical weathering.

Although disagreements exist in regard to the relative influences of time and other soil-forming factors, the concept of intermittency of soil formation has been supported by numerous studies and provides a practical technique to discuss the age of soil in the survey area in relation to geologic climatic units in Quaternary time. For the purposes of this discussion, time-stratigraphic names will be as set forth by Birkeland *(3)*. These are Holocene (0 to 10,000 years), Late Wisconsin (10,000 to 30,000 years), Middle Wisconsin (30,000 to 40,000 years), Early Wisconsin (40,000 to 130,000 years), and pre-Wisconsin (130,000 years or more).

The kinds of diagnostic subsurface horizons and other subsurface diagnostic properties *(17)*, together with their strength of expression, provide general clues to the age of the soils in the area. Important subsurface diagnostic horizons present in soils within the area include argillic, natric, and cambic horizons and horizons exhibiting silica cementation.

Prominent argillic horizons in this area generally are present only in soils that formed primarily during Wisconsin and pre-Wisconsin time. This concept has been established by studies in the Southwest *(5, 6)* and is further supported in Soil Taxonomy *(18)*. With increasing age and constancy of other conditions, argillic horizons become finer in texture, become somewhat thicker, and tend to develop abrupt upper boundaries. Weakly expressed, thin argillic horizons may have formed during very Late Wisconsin or Early Holocene time.

Natric horizons are special kinds of argillic horizons that formed under the influence of high exchangeable sodium content. The effect of sodium on the dispersion of clay may tend to accelerate the rate of formation of argillic horizons. This is not believed to be significant, however, except in weakly expressed natric horizons that formed on Holocene surfaces. Following earlier development as argillic horizons, prominent natric horizons may have developed their present characteristics as a result of sodium supplied with eolian deposits. Transportation and deposition of sodium salts with eolian deposits are believed to be important present-day processes that affect the physical and chemical properties of soils in the area.

The volcanic glass in sediment derived from pyroclastic material and in alluvial and eolian deposits of volcanic ash is a source of silica for the formation of duripans and durinodes in many of the soils in the survey area. Duripans are massive or platy horizons that are cemented with silica and, in most instances, with accessory carbonates. Because of their association with prominent argillic horizons, massive duripans capped with silica- and lime-cemented laminar layers are probably the oldest kind of duripan in the area and are of pre-Wisconsin age. Thin duripans that are not overlain by laminar layers, layers that have weak discontinuous silica cementation, or durinodes have apparently developed on Holocene surfaces in loess or loamy alluvium generally deposited on gravelly material. These forms of silica cementation apparently are capable of forming during a relatively short period of time and are probably less than 7,000 years old.

The degree of development of diagnostic subsurface horizons in the soils of the area indicates a sequence

that ranges in age from present (late Holocene) to pre-Wisconsin.

The youngest soils in the survey area are those that formed in recently aggraded material or in material recently exposed by erosion. Included among these are Piltdown and Clowfin soils (Typic Torriorthents) and Needle Peak soils (Aquic Torriorthents) that formed in recent alluvium; also included are shallow Puett soils (Xeric Torriorthents) and moderately deep Perwick soils (Xeric Torriorthents) that formed in Tertiary sediment on low hills where geologic erosion has been active.

Somewhat older than the youngest soils are soils that formed in alluvium on wet flood plains, soils on slowly aggrading inset fans, and soils on relatively recently eroded mountainsides. These soils have been stable long enough to have accumulated organic matter and formed a dark-colored A horizon. They do not have an argillic, natric, cambic, or calcic horizon, a duripan, or a durinode. They are probably less than about 1,000 years old. Soils of the Humboldt series (Fluvaquentic Haplaquolls) are examples of soils that formed on wet flood plains. Soils of the Paranat series (Fluvaquentic Haploxerolls) are examples of soils that formed on moderately wet flood plains. Soils of the Loncan series (Aridic Haploxerolls) and the Labshaft series (Lithic Cryoborolls) are examples of soils that formed on mountainsides.

Soils that formed in alluvium and have developed subsurface horizons containing durinodes or horizons with very weak silica cementation are also older than the youngest soils and possibly are slightly older than the soils that have developed a dark-colored A horizon as their only diagnostic feature. These soils formed in saline- and alkali-affected parent material containing appreciable amounts of volcanic ash and are on alluvial flats. The volcanic ash as a source of soluble silica, along with the alkaline reaction, probably contributes to relatively rapid formation of durinodes and incipient silica cementation. Soils of the Ocala and Wendane series (Aeric Halaquepts) are examples of soils that have horizons with incipient silica cementation.

Stable Holocene land surfaces less than about 10,000 years and more than 2,000 years old are extensive in the survey area. The soils that formed on these surfaces have a cambic horizon. Cambic horizons in soils within the area formed for the most part in calcareous sediment. Original stratification is absent, and carbonates have been removed and redeposited in underlying horizons. Investigations in southern New Mexico indicate that cambic horizons in that region are less than about 5,000 years old *(4, 7)*. Cambic horizons in the survey area and in other areas in Nevada generally have been thought to be less than 10,000 years old, and possibly less than 7,000 years. This age has been determined mostly as a result of soil mapping in areas located below the last high stage of Pleistocene Lake Lahontan *(8, 9, 10, 11)*. Soils of the Whirlo and Pumper series (Typic Camborthids) are examples of soils that have a cambic horizon and are on alluvial fans and fan skirts. Soils of the McConnel, Jesse Camp, and Akercan series (Xerollic Camborthids) are examples of soils that have a cambic horizon and are on offshore bars, inset fans, and flood plains. Soils of the Hatur series (Cryic Rendolls) are examples of soils that have a cambic horizon and are on mountainsides.

The landscape in some areas is less stable and has been stripped by subsequent erosion during Late Wisconsin, thus exposing relict duripans. Following redeposition during middle to early Holocene time, loess and loamy alluvium derived from surrounding land surfaces covered these relict subsurface horizons to a shallow depth. Soil development of the surface alluvium has been minimal. Soils of the Nadra and Kodra series (Entic Durorthids) and the Tenvorrd, Lien, and Umil series (Xerollic Durorthids) are examples of these soils on fan piedmonts and ballenas.

Soils that have a relict argillic horizon are believed to be of Late Wisconsin to pre-Wisconsin age. These soils occur extensively on mountains, hills, and fan piedmonts. The fact that extensive areas of these kinds of soil exist today is evidence that major erosional and depositional events have not taken place or have been minor in extent since late Pleistocene time.

Stable Early to Late Wisconsin or Middle Wisconsin land surfaces are extensive. These soils have dominantly fine-loamy or loamy-skeletal argillic or natric horizons. Soils of the Alley, Nevador, and Pineval series (Durixerollic Haplargids) are an example of soils that have an argillic horizon and are on fan piedmonts. Soils of the Ricert series (Duric Natrargids) are an example of soils on fan piedmonts. Soils of the Bregar series (Xerollic Haplargids) are an example of soils that have an argillic horizon and are on hillsides and mountainsides. Soils of the Jivas series (Aridic Argixerolls) are examples of soils on mountainsides.

During this same period, thin and moderately thick duripans formed in some soils that have argillic and natric horizons and are on the older landscapes in the area. Soils of the Cherry Spring series (Haploxerollic Durargids) and the Tenabo series (Typic Nadurargids) are examples of these soils on fan piedmonts.

Stable Early Wisconsin or Early to Middle Wisconsin land surfaces are extensive in the survey area. The soils on these surfaces have well developed, fine textured argillic or natric horizons. They occupy older, stable land surfaces, where the original subsurface horizons have been neither stripped by erosion nor deeply buried by sediment. Soils of the Stampede series (Aridic Durixerolls) and the Valcrest and Tomera series (Xerollic Natrargids) are examples of these soils on fan piedmonts. Soils of the Ravenswood series (Typic Argixerolls) are examples of these soils on mountainsides.

Stable very Early Wisconsin and pre-Wisconsin surfaces are moderately extensive in the area. The soils on these surfaces are relatively stable, are deeply dissected, are fine and very fine textured, and have an argillic horizon that has an abrupt upper boundary. It is because of these characteristics that these soils are considered to be the oldest in the area. Soils of the Donna series (Abruptic Aridic Durixerolls) are examples of these soils on fan piedmonts. Soils of the Ebic series (Typic Palexerolls) and Freznik series (Xerollic Paleargids) are examples of these soils on mountainsides.

References

(1) American Association of State Highway and Transportation Officials. 1982. Standard specifications for highway materials and methods of sampling and testing. Ed. 13, 2 vol., illus.

(2) American Society for Testing and Materials. 1974. Method for classification of soils for engineering purposes. ASTM Stand. D 2487-69. *In* 1974 Annual Book of ASTM Standards, Part 19, 464 pp., illus.

(3) Birkeland, Peter W. 1974. Pedology, weathering, and geomorphological research, 285 pp.

(4) Gile, L.H. 1966. Cambic and certain noncambic horizons in desert soils of southern New Mexico. Soil Sci. Soc. of Am. Proc., vol 30, pp. 773-781.

(5) Gile, L.H. and R.B. Grossman. 1968. Morphology of the argillic horizon in desert soils of southern New Mexico. Soil Sci., vol. 106, no. 1, pp. 6-15.

(6) Gile, L.H. and J.W. Hawley. 1966. Periodic sedimentation and soil formation on an alluvial fan piedmont in southern New Mexico. Soil Sci. Soc. of Am. Proc., vol. 30, pp. 261-268.

(7) Gile, L.H., F.F. Peterson, and R.B. Grossman. 1966. Morphological and genetic sequences of carbonate accumulation is desert soils. Soil Sci., vol. 101, pp. 347-360.

(8) Hawley, J.W. (n.d.) The Late Pleistocene and recent geology of the Winnemucca segment of the Humboldt River Valley, Nevada. Ph.D. thesis, University of Illinois.

(9) Morrison, R.B. 1964. Lake Lahontan: Geology of the Carson Desert, Nevada. U.S. Geol. Surv. Prof. Pap. 401, 156 pp., illus.

(10) Morrison, R.B. (n.d.) Soil stratigraphy: Principles, applications to differentiation and correlation of Quaternary deposits and landforms, and applications to soil science. Ph.D. thesis, University of Nevada.

(11) Morrison, R.B. 1965. Principles of Quaternary soil stratigraphy. *In* Quaternary Soils, INQA. Proc., vol. 9, VII Congress, pp. 1-69.

(12) Nikiforoff, C.C. 1942. Fundamental formula of soil formation. Am. J. of Sci., vol. 240, pp. 847-866.

(13) Nikiforoff, C.C. 1949. Weathering and soil evolution. Soil Sci., vol. 67, pp. 219-223.

(14) Peterson, Frederick F. 1981. Landforms of the Basin and Range province defined for soil survey. NV Agric. Exp. Stn. Tech. Bull. 28, 52 pp., illus.

(15) Richmond, G.M. 1962. Quaternary geology of the La Sal Mountains, Utah. U.S. Geol. Surv. Prof. Pap. 324, 135 pp., illus.

(16) Springer, M.E. (n.d.) Soil formation in the desert of the Lahontan Basin, Nevada. Ph.D. thesis, University of California.

(17) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus.

(18) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436, 754 pp., illus.

(19) United States Department of Agriculture. 1981. National handbook of plant names, 430-VI. Soil Conserv. Serv.

(20) United States Department of Agriculture. 1983. National Soils Handbook 430-VI, part 603.03. Soil Conserv. Serv.

(21) Ward, W.T. 1965. Soils of the Adelaide Area, South Australia, in relation to time. *In* Quaternary Soils, INQA. Proc., vol. 9, VII Congress, pp. 293-306.

Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted. The degrees of alkalinity are:

	ESP
Nonalkali	less than 15
Slightly alkali	15 to 40
Strongly alkali	more than 40

Alluvial fan. A semiconical, or fan-shaped, constructional major landform that is mainly stratified alluvium with debris flow deposits in some areas. It is on the upper margin of a piedmont slope, and its apex is a source of alluvium debouching from a mountain valley into an intermontane basin. Also, a generic term for similar landforms in various other landscape positions.

Alluvial flat. The nearly level alluvial surface between a piedmont slope and the playa of a bolson or the axial-stream flood plain of a semibolson. This landform can include both recent and relict components.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Animal-unit-month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Arroyo valley. A small valley that is tributary to a major valley of a desert stream.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Back slope. The slope component that is the steepest, straight to concave or merely concave, middle part of an erosional slope.

Badland. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Ballena. A major landform comprising distinctively round-topped ridgeline remnants of fan alluvium. The broadly rounded shoulders of the ridge meet from either side to form a narrow crest and merge smoothly with the concave back slopes. In ideal examples, the slightly concave foot slopes of adjacent ballenas merge to form a smoothly rounded drainageway.

Bar (offshore and barrier). A component landform comprised of elongated, commonly curving, low ridges of well sorted sand and gravel that stand above the general level of a bolson floor. It is the result of the wave action of a Pleistocene lake.

Basal area. The area of a cross section of a tree. It is a measure of stand density, commonly expressed in square feet. For pinyon pine and juniper stands, it is the section at a height of 1 foot and is measured outside the bark.

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Basin. A general term for an intermontane basin, a bolson, a semibolson, an area of centripetal drainage, or a structural depressional area.

Basin floor. The lowermost, nearly level major physiographic part of a bolson or semibolson. It includes all alluvial, eolian, and erosional landforms that are below the piedmont slopes.

Basin-floor remnant. A generally flat-topped erosional remnant of a basin floor that has been dissected by an axial stream.

Beach plain. A major landform of bolson floors comprised of numerous, closely spaced offshore bars and intervening lagoons. It is the result of a receding Pleistocene lake.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bolson. An internally drained intermontane basin.

Bolson floor. The specific identification of the floor of a bolson, as compared with the floor of a semibolson; both are basin floors.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Brush management. Use of mechanical, chemical, or biological methods to reduce or eliminate competition of woody vegetation to allow understory grasses and forbs to recover, or to make conditions favorable for reseeding. It increases production of forage, which reduces erosion. Brush management may improve the habitat for some species of wildlife.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary fringe. The zone directly above the water table that is wetted as a result of the suction created by very small pores.

Channel. The bed of a single or braided waterway that commonly is barren of vegetation. Channels form in young alluvium. They may be enclosed by banks, or they may be splayed across a fan surface and slightly mounded above it. They may include bars and dumps, consisting of cobbles and stones. Channels, except flood plain playas, are landform elements.

Chemical treatment. Control of unwanted vegetation by use of chemicals.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter, in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clay skin. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay film.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Very cobbly soil material is 35 to 60 percent cobble-sized rock fragments, and extremely cobbly soil material is more than 60 percent.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Component landform. A feature of the Earth's surface that is part of a major landform and was created by partial dissection of the major landform or by alluvial or eolian accretion. A component landform is the smallest type of landform that can be described as a single unit. Its morphological parts are called landform elements, and a side slope element can be subdivided into slope components.

Conglomerate. A coarse grained, clastic rock composed of rounded to subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. If soil improving crops and practices used in the system more than offset the soil depleting crops and deteriorating practices, then it is a good conservation cropping system. Cropping systems are needed on all tilled soils. Soil improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—Readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—Adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coppice dune. A small dune of fine-earth soil material stabilized around shrubs or small trees.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crest. The slope component comprising a very narrow, commonly linear top of a landform such as an erosional ridge, hill, or mountain.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system. Growing crops using a planned system of rotation and management practices.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or arresting grazing for a prescribed period.

Desert pavement. A layer of gravel or coarser fragments on a desert soil surface that was emplaced by upward movement of fragments from underlying sediment or remains after finer particles have been removed by running water or wind.

Desert stream valley. A valley cut through several desert semibolsons by a perennial, mountain-fed stream.

Desert varnish. A glossy sheen or coating on stones and gravel in arid regions.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—These soils have very high and high hydraulic conductivity and low water holding capacity. They are not suited for crop production unless irrigated.

Somewhat excessively drained.—These soils have high hydraulic conductivity and low water holding capacity. Without irrigation, only a narrow range of crops can be grown and yields are low.

Well drained.—These soils have intermediate water holding capacity. They retain optimum amounts of moisture, but they are not wet close enough to the surface or long enough during the growing season to adversely affect yields.

Moderately well drained.—These soils are wet close enough to the surface or long enough that planting or harvesting operations or yields of some field crops are adversely affected unless artificial drainage is provided. Moderately well drained soils commonly have a layer with low hydraulic conductivity, a wet layer relatively high in the profile, additions of water by seepage, or some combination of these.

Somewhat poorly drained.—These soils are wet close enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless artificial drainage is provided. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, a wet layer high in the profile, additions of water through seepage, or a combination of these.

Poorly drained.—These soils commonly are so wet at or near the surface during a considerable part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these.

Very poorly drained.—These soils are wet to the surface most of the time. They are wet enough to prevent the growth of important crops (except rice) unless artificially drained.

Drainage, surface. Runoff, or surface flow of water, from an area.

Draw. A small stream valley, generally more open and with broader bottom land than a ravine or gulch.

Duff. A term used to identify a generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Effervescence. The quality of a soil measured when drops of diluted (1:10) hydrochloric acid (HCl) are added to the soil. The ratings are as follows:

Very slightly effervescent	few bubbles
Slightly effervescent	bubbles readily
Strongly effervescent	bubbles form low foam
Violently effervescent	bubbles form thick foam quickly

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature; for example, fire that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and produced by erosion or faulting. Synonym: scarp.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the Earth's surface.

Fan apron. A component landform consisting of a sheetlike mantle of relatively young alluvium that partially covers the surface of an older fan piedmont or, in some places, an alluvial fan. A fan apron buries a pedogenic soil.

Fan piedmont. The most extensive major landform of most piedmont slopes. It is formed by the lateral coalescence of mountain-front alluvial fans into one generally smooth slope and by accretion of fan aprons. Fan piedmonts commonly are complexes of many component landforms.

Fan remnant. A generic term for a component landform that is the remainder of various older fans that have been dissected (erosional fan remnants) or partially buried (nonburied fan remnants). Erosional fan remnants have a flattish summit that consists of a relict fan surface; nonburied fan remnants consist entirely of a relict fan surface.

Fan remnant side slope. A landform element comprised of the relatively young erosional slope around the sides of an erosional fan remnant. It is composed of shoulders, back slopes, and foot slopes.

Fan skirt. A major landform comprised of laterally coalescing, small alluvial fans that originate from gullies that are cut into or extend from inset fans of a fan piedmont and merge along their toe slopes with the basin floor. Fan skirts are smooth or only slightly dissected.

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. The transversely level floor of an axial stream of a semibolson or of a major desert stream valley that is occasionally or regularly alluviated by the stream overflowing its channel during periods of flooding.

Flood-plain playa. A component landform consisting of very low gradient, barren, axial stream segments in an intermontane basin. It is subject to broad and shallow floods and is veneered with barren, fine textured sediment that crusts. A flood plain playa commonly is segmented by transverse, narrow bands of vegetation, and it may alternate with ordinary, narrow or braided channel segments.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

Foot slope. The relatively gently sloping, slightly concave slope component of an erosional slope that is at the base of the back slope component. Synonym: pediment.

Forb. Any herbaceous plant not a grass or a sedge.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter. Very gravelly soil material is 35 to 60 percent gravel-sized rock fragments, and extremely gravelly is more than 60 percent.

Hard rock. Rock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by silica or calcium carbonate.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well-defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An

explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the number 2 precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors of predicting runoff. The four hydrologic groups are:

Group A.—Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B.—Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C.—Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D.—Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Inset fan. The flood plain of a commonly ephemeral stream that is confined between fan remnants, basin floor remnants, ballenas, or closely opposed fan toe slopes. Its transversely level cross section is evidence of alluviation of a fluve. It is wide enough that raw channels cover only a fraction of its surface.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Irrigation. Application of water to soils to assist in production of crops.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain. A major landform of some bolson floors that is nearly level and consists of fine textured, stratified bottom sediment of a Pleistocene lake.

Lake-plain terrace. A somewhat elevated area and component landform of a lake plain.

Landform element. The morphological part of a component landform. Side slope landform elements may be divided into slope components.

Leaching. The removal of soluble material from soil or other material by percolating water.

Light textured soil. Sand and loamy sand.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Major landform. A subdivision of the piedmont slope or basin floor major physiographic part that reflects a major morphogenetic process taking place over a long period of time or that is the result of a special erosional or depositional process. Many major landforms are dissected, and their original area is occupied by component landforms.

Major physiographic part. The very large part of an intermontane basin that is characterized by dominant slope and position and is comprised of major landforms (i.e., steeply sloping mountains that stand above less sloping piedmonts that in turn grade to nearly level basin floors).

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides and considerable bare-rock surface. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Mountain-valley fan. A major landform that is the result of alluvial filling of a mountain valley or intramontane basin by coalescent valley-side slope fans whose toe slopes meet from either side of the valley along an axial drainageway. It is an extension of the upper piedmont slope into mountain valleys. Most mountain-valley fans have been dissected.

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color in hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Observed rooting depth. Depth to which roots have been observed to penetrate.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan* or *claypan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pediment. The foot slope component of an erosional slope.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Plain. A flat, undulating or rolling area, large or small, that includes few prominent hills or valleys. It

generally is at a low elevation in relation to surrounding areas, and it may have considerable overall slope and local relief.

Playa. An ephemerally flooded, barren area on a basin floor that is veneered with fine textured sediment and acts as a temporary or final sink for drainage water.

Piping. Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressional areas. The water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. The plant community on a given site that will be established if present environmental conditions continue to prevail and the site is properly managed.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. The application of fire to land under such conditions of weather, soil moisture, and time of day as presumably will result in the intensity of heat and spread required to accomplish specific forest management, wildlife, grazing, or fire hazard reduction purposes.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This increases the vigor and reproduction of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relict. Old, or remaining from previous times; in the present context, of Pleistocene age.

Relief. The elevations or inequalities of a land surface, considered collectively.

Remnant. The remainder of a larger landform or of a land surface that has been dissected or partially buried.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Ridgeline remnant. A narrow ridge that has a fully rounded crest and is accordant with the crests of similar, nearby ridges. Together these accordant crests approximately mark the position of a pre-existing land surface that has been destroyed by dissection.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water. Six classes of runoff are recognized:

Ponded.—Little of the precipitation and runon escapes as runoff, and free water stands on the surface for significant periods. The amount of water that must be removed from ponded areas by

movement through the soil, by plants, or by evaporation is usually greater than the total rainfall. Ponding normally occurs in level to nearly level depressional areas, and the water depth may fluctuate greatly.

Very slow.—Surface water flows away slowly, and free water stands on the surface for long periods or immediately enters the soil. Most of the water passes through the soil, is used by plants, or evaporates. The soils commonly are level or nearly level or are very open and porous.

Slow.—Surface water flows away slowly enough that free water stands on the surface for moderate periods or enters the soil rapidly. Most of the water passes through the soil, is used by plants, or evaporates. The soils commonly are either nearly level or very gently sloping or they are steeper but absorb precipitation very rapidly.

Medium.—Surface water flows away fast enough that free water stands on the surface for only short periods. Part of the precipitation enters the soil and is used by plants, is lost by evaporation, or moves into underground channels. The soils commonly are either nearly level or gently sloping and absorb precipitation at a moderate rate or they are steeper but absorb water rapidly.

Rapid.—Surface water flows away fast enough that the period of concentration is brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly moderately steep or steep, and they have a moderate to slow rate of absorption.

Very rapid.—Surface water flows away so fast that the period of concentration is very brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly steep or very steep, and they absorb precipitation slowly.

Runon. Soil moisture received as runoff from adjacent areas.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium. The conductivity of extract, in millimhos per centimeter, is expressed as—

	Millimhos
Nonsaline	0 to 4
Slightly saline	4 to 8
Moderately saline	8 to 16
Strongly saline	more than 16

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sand dune. A component landform made up of eolian, sand-sized mineral particles. Dunes commonly are on the leeward side of a Pleistocene lakebed.

Sand sheet. A major landform comprising an extensive, several-foot-thick layer of eolian sand from pluvial lake beaches, sometimes partly redeposited by water. It is spread across alluvial flats, onto piedmont slopes, or even over low mountains and has an undulating and commonly duned surface.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Semibolson. An externally drained intermontane basin.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Shoulder. The convex slope component at the top of an erosional side slope.

Side slope. The erosional slope around the sides of an erosional fan remnant, hill, ballena, mountain, etc. It is composed of shoulders, back slopes, foot slopes, and toe slopes. Also, the planimetrically linear parts of the slopes around a digitately dissected fan remnant or hill, or other landform, as compared with the planimetrically convex nose slope and concave head slope parts.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site. For pinyon pine and juniper stands, it is based on tree diameter at a height of 1 foot height and the spacing between trees.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey the following slope classes are recognized:

	Percent
Nearly level	0 to 2
Gently sloping	2 to 4
Moderately sloping	4 to 8
Strongly sloping	8 to 15
Moderately steep	15 to 30
Steep	30 to 50
Very steep	50 to 75
Extremely steep	more than 75

Slope component. A morphological element of an erosional slope and a morphological subdivision of the side slope landform element.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^+ to $Ca^{++} + Mg^{++}$. The degrees of sodicity are—

	SAR
Nonsodic	less than 13
Slightly sodic	13 to 46
Strongly sodic	more than 46

Soft rock. Rock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 6 to 15 inches (15 to 38 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stony soil material. Material, commonly a subsurface layer, that is 15 to 35 percent, by volume, rock fragments that are mainly 10 to 24 inches (25 to 60 centimeters) in diameter. Very stony soil material is 35 to 60 percent stone-sized fragments, and extremely stony soil material is more than 60 percent.

Stream terrace. A transversely level erosional remnant of a former axial stream or major desert stream flood plain that slopes in the same direction as the adjacent, incised stream and is underlain by well-sorted, stratified sand and gravel or by loamy or clayey sediment.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Summit. The flattish top of an erosional fan remnant, hill, mountain, or other landform. The term is used for both a landform element and a slope component.

Tail water. The water just downstream of a structure.

Talus. Rock fragments of any size or shape, commonly coarse and angular, derived from and lying at the base of a cliff or very steep, rock slope. The accumulated mass of such loose, broken rock formed chiefly by falling, rolling, or sliding.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. Any part of a general slope that stands above a short, steep scarp and has a generally flat, nearly level or gently sloping summit. It may have another short scarp above the summit. Synonym: bench.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Toe slope. The lowest part of a foot slope component of an erosional slope. It is distinguished from the upper part of a foot slope by a greater accumulation

of pedisediment. Also, the lowest and most gently sloping part of a slope.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Valley. An elongated depressional area cut by stream erosion and the associated water erosion of its side slopes (stream valley). Also used for intermontane basins.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water supplying capacity. The total amount of water available in the soil for plant growth in a normal year from precipitation, from runon, and from a capillary fringe minus runoff.

Water table. The upper level of ground water or that level below which the soil is saturated.

Water table (perched). The water table of a saturated layer of soil that is separated from an underlying saturated layer by an unsaturated layer.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the Earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Tables

TABLE 161.--TEMPERATURE AND PRECIPITATION

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
Recorded in the period 1951-75 at Beowawe, NV											
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	41.8	14.9	28.1	60	-16	39	.69	.32	.99	2	2.2
February---	47.1	20.7	34.0	66	-4	61	.58	.19	.88	2	2.0
March------	53.1	23.8	38.4	75	5	78	.60	.14	.95	2	1.9
April------	62.7	28.5	45.6	82	12	197	.73	.17	1.17	2	.0
May--------	73.2	36.9	55.1	93	18	474	.92	.11	1.55	2	.0
June-------	82.2	44.1	63.3	100	28	699	1.04	.00	1.70	2	.0
July-------	93.0	45.4	71.2	103	36	967	.32	.03	.53	1	.0
August-----	90.3	46.8	68.6	102	30	887	.36	.00	.03	1	.0
September--	81.1	36.5	58.8	90	19	564	.34	.00	.62	1	.0
October----	69.0	28.4	48.7	86	10	281	.54	.00	.84	1	.0
November---	52.7	21.0	36.9	73	0	64	.71	.28	1.08	2	.7
December---	42.0	16.0	29.0	59	-13	23	.84	.36	1.23	3	3.2
Yearly:	65.7	30.6	48.1	104	-16	4,334	7.67	5.58	9.74	21	10.0

See footnote at end of table.

TABLE 161.--TEMPERATURE AND PRECIPITATION--Continued

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
Recorded in the period 1966-75 at Carlin, NV											
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	34.2	18.7	26.5	54	-8	0	1.40	.79	1.88	4	10.1
February---	38.8	21.8	30.3	58	4	11	.98	.26	1.55	4	9.2
March------	43.7	24.6	34.2	67	7	61	1.44	.96	1.87	5	8.8
April------	49.1	28.6	38.9	72	14	101	1.48	.69	2.12	5	6.1
May--------	63.7	40.0	51.9	83	21	381	1.09	.28	1.73	2	.3
June-------	72.3	49.3	60.8	91	30	624	1.84	.77	2.79	4	.0
July-------	84.6	59.2	72.0	94	38	992	.66	.11	1.07	2	.0
August-----	82.5	57.2	69.8	93	42	924	.47	.00	.79	1	.0
September--	73.0	47.3	60.2	89	28	606	.51	.00	.86	1	.0
October----	57.4	35.3	46.4	78	12	224	1.31	.64	1.84	4	2.2
November---	42.7	27.4	35.6	65	9	46	1.45	.71	2.05	4	4.9
December---	33.2	18.2	25.7	52	-5	11	2.14	1.33	2.86	6	14.0
Yearly:	56.4	35.6	46.0	94	-10	3,981	14.77	11.01	17.58	42	55.6

See footnote at end of table.

TABLE 161.--TEMPERATURE AND PRECIPITATION--Continued

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	Recorded in the period 1964-78 at Eureka, NV										
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	38.6	17.7	28.2	57	-8	0	.91	.37	1.36	3	10.0
February---	42.2	20.8	31.5	61	-2	18	1.02	.41	1.52	4	10.3
March------	48.0	23.3	35.7	69	-2	73	1.27	.44	1.94	4	14.0
April------	53.8	27.4	40.6	75	10	124	1.59	.58	2.43	5	9.5
May--------	66.4	36.8	51.6	85	16	375	1.50	.45	2.34	4	5.0
June-------	76.3	44.6	60.5	92	27	615	1.34	.18	2.22	4	.1
July-------	86.3	53.4	69.9	96	38	927	.81	.24	1.26	3	.0
August-----	83.4	51.7	67.6	95	35	856	.96	.21	1.54	3	.0
September--	74.0	43.2	58.6	89	22	558	.98	.19	1.59	3	.5
October----	62.7	33.7	48.2	80	11	275	.95	.21	1.52	3	4.0
November---	47.7	25.3	36.5	69	1	46	1.08	.40	1.63	3	7.7
December---	38.0	16.8	27.4	55	-9	11	1.38	.64	2.02	5	15.6
Yearly:											
Average--	59.8	32.9	46.4	---	---	---	---	---	---	---	---
Extreme--	---	---	---	96	-13	---	---	---	---	---	---
Total----	---	---	---	---	---	3,878	13.79	10.37	16.86	44	76.7

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for range vegetation in the area (40 °F).

TABLE 162.--FREEZE DATES IN SPRING AND FALL

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Recorded in the period 1951-75 at Beowawe, NV			
Last freezing temperature in spring:			
1 year in 10 later than--	May 22	June 10	June 20
2 years in 10 later than--	May 15	June 3	June 13
5 years in 10 later than--	May 3	May 20	May 31
First freezing temperature in fall:			
1 year in 10 earlier than--	September 9	August 24	August 6
2 years in 10 earlier than--	September 17	September 1	August 16
5 years in 10 earlier than--	October 1	September 16	September 2
Recorded in the period 1966-75 at Carlin, NV			
Last freezing temperature in spring:			
1 year in 10 later than--	May 15	May 31	June 18
2 years in 10 later than--	May 11	May 25	June 11
5 years in 10 later than--	May 2	May 13	May 29
First freezing temperature in fall:			
1 year in 10 earlier than--	October 1	September 24	August 11
2 years in 10 earlier than--	October 9	September 29	August 25
5 years in 10 earlier than--	October 25	October 9	September 21

TABLE 162.--FREEZE DATES IN SPRING AND FALL--Continued

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Recorded in the period 1964-78 at Eureka, NV			
Last freezing temperature in spring:			
1 year in 10 later than--	May 23	June 13	June 30
2 years in 10 later than--	May 17	June 6	June 24
5 years in 10 later than--	May 7	May 24	June 12
First freezing temperature in fall:			
1 year in 10 earlier than--	September 21	September 8	August 27
2 years in 10 earlier than--	September 27	September 15	September 3
5 years in 10 earlier than--	October 10	September 27	September 16

TABLE 163.--GROWING SEASON

Probability	Length of growing season if daily minimum temperature exceeds--		
	24 °F	28 °F	32 °F
Recorded in the period 1966-75 at Carlin, NV			
	Days	Days	Days
9 years in 10	141	127	82
8 years in 10	153	134	93
5 years in 10	175	148	114
2 years in 10	198	163	135
1 year in 10	210	170	146
Recorded in the period 1951-75 at Beowawe, NV			
	Days	Days	Days
9 years in 10	116	79	58
8 years in 10	128	92	70
5 years in 10	150	118	94
2 years in 10	173	144	118
1 year in 10	185	157	130
Recorded in the period 1964-78 at Eureka, NV			
	Days	Days	Days
9 years in 10	126	106	72
8 years in 10	136	113	80
5 years in 10	155	126	95
2 years in 10	175	139	110
1 year in 10	185	146	118

TABLE 164.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
100	Wholan silt loam, cool, occasionally flooded	521	*
101	Wholan-Clowfin association	4,787	0.3
111	Lien-Hayeston association	61,382	4.2
121	Piltdown fine sandy loam	4,322	0.3
131	Pumper sandy loam, cool	12,560	0.9
141	Pedoli-Poorcal association	16,483	1.1
142	Pedoli-Shipley association	9,082	0.6
143	Pedoli-Silverado association	18,185	1.2
155	Sonoma silt loam, frequently flooded, strongly saline	175	*
160	Ocala association	3,823	0.3
161	Ocala silt loam, occasionally flooded	6,154	0.4
164	Ocala silt loam, rarely flooded	30	*
171	Nuc-Maghills association	11,200	0.8
172	Nuc-Maghills complex, 2 to 8 percent slopes	2,738	0.2
180	Clowfin sandy loam, 0 to 2 percent slopes	1,220	0.1
190	Broyles silt loam, cool, 0 to 2 percent slopes	7,687	0.5
191	Broyles-Pumper complex, 0 to 2 percent slopes	8,572	0.6
192	Broyles-Ricert association	6,015	0.4
200	Sonoma Variant silt loam	65	*
201	Umil loam, 2 to 8 percent slopes	20,942	1.4
202	Umil-Hayeston association	7,995	0.5
203	Umil-Clowfin association	4,894	0.3
210	Molion loam, 2 to 8 percent slopes	8,521	0.6
211	Molion-Kobeh association	2,789	0.2
221	Hodedo stony loam, 2 to 8 percent slopes	9,840	0.7
222	Hodedo-Coils association	6,393	0.4
223	Hodedo very stony loam, 15 to 30 percent slopes	3,214	0.2
230	Nadra loam, 0 to 4 percent slopes	25,772	1.8
241	Humboldt loam, drained, slightly saline, rarely flooded	3,235	0.2
250	Dianev silt loam, occasionally flooded	7,953	0.5
260	Shipley fine sandy loam, occasionally flooded, 0 to 4 percent slopes	7,178	0.5
270	Poorcal loam, 0 to 4 percent slopes	8,520	0.6
271	Poorcal-Lopwash association	363	*
280	Coils loam, 2 to 8 percent slopes	19,427	1.3
282	Coils-Mau association	2,273	0.2
283	Coils-Umil assoication	2,625	0.2
291	Ricert-Pumper-Clowfin association	2,830	0.2
292	Ricert-Silverado association	4,566	0.3
293	Ricert-Nevador association	12,099	0.8
300	Rutab loam	7,306	0.5
311	Eightmile-Loncan-Glean association	3,910	0.3
321	Mau-Shagnasty-Eightmile association	36,112	2.5
330	Hopeka-Solak-Ados association	54,715	3.7
331	Hopeka-Solak-Rock outcrop association	11,147	0.8
332	Hopeka-Cavehill association	5,830	0.4
341	Tenvorrd-Kodra association	1,010	0.1
350	Fenster silt loam	7,469	0.5
351	Fenster silt loam, nonsaline-alkali, frequently flooded	2,345	0.2
352	Fenster-Jesse Camp association	6,556	0.4
353	Fenster-Jesse Camp association, alkali	419	*
361	Loncan Variant loam	340	*
370	Kobeh gravelly loam, 0 to 2 percent slopes	2,317	0.2
371	Kobeh-Shipley association	5,706	0.4
382	Toeja-Puett association	1,005	0.1
392	Lopwash loam, 0 to 4 percent slopes	7,065	0.5
400	Brinnum silt loam	2,264	0.2
401	Brinnum-Humboldt association	1,525	0.1
410	Beanflat silt loam	17,220	1.2
422	Chen-Ramires association, steep	2,785	0.2
423	Chen-Ramires association, moderately steep	2,610	0.2
424	Chen-Singletree-Jivas association	12,885	0.9
425	Chen-Pie Creek-Ramires association	760	0.1
431	Ramires-Singletree association	3,590	0.2

See footnote at end of table.

TABLE 164.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
440	Akercan loam	3,776	0.3
451	Foxmount-Haunchee-Rock outcrop association	10,261	0.7
452	Foxmount-Winu-Hackwood association	2,466	0.2
462	Haunchee-Hatur-Rock outcrop association	5,716	0.4
471	Labshaft-Winu association	6,510	0.4
480	Winu-Mosquet association	2,966	0.2
481	Winu-Spinlin association	7,116	0.5
491	Rock outcrop-Labshaft association	4,681	0.3
492	Rockcrop-Winu-Decram association	1,189	0.1
501	Hymas-Ansping association	34,478	2.3
511	Ansping-Hymas association	9,311	0.6
521	Soughe Variant-Pie Creek-Singletree association	580	*
525	Soughe-Fortank-Kodra Variant association	7,520	0.5
531	Granzan Variant-Granzan-Highams Variant association	2,505	0.2
550	Decram-Decram Variant-Duff association	3,755	0.3
551	Decram-Hapgood association	4,886	0.3
552	Decram-Hapgood-Loncan association	964	0.1
553	Decram-Winu-Chad association	1,071	0.1
561	Cherry Spring-Tomera association	14,975	1.0
565	Cherry Spring Variant-Tomera-Bregar association	4,220	0.3
581	Tomera loam, 4 to 8 percent slopes	4,505	0.3
590	Hayeston sandy loam, 0 to 4 percent slopes	13,628	0.9
600	Rubyhill sandy loam, 0 to 4 percent slopes	16,166	1.1
601	Rubyhill-Barrier association	39,076	2.7
610	Needle Peak silt loam, occasionally flooded	2,056	0.1
620	Silverado sandy loam, 2 to 8 percent slopes	35,537	2.4
621	Silverado sandy loam, 0 to 2 percent slopes	28,815	2.0
630	Jesse Camp silt loam	13,285	0.9
641	Valcrest-Tomera association	14,770	1.0
651	Barrier-Kobeh association	125	*
661	Akerue-Simpark-Robson association	12,259	0.8
671	Whirlo gravelly loam, 2 to 8 percent slopes	2,980	0.2
672	Whirlo-Creemon association	6,455	0.4
681	Chad-Cleavage-Softscrabble association	12,775	0.9
682	Chad-Gando-Softscrabble association	21,640	1.5
691	Ravenswood-Shagnasty-Walti association	10,031	0.7
701	Loncan-Gando-Glean association	12,658	0.9
711	Singletree Variant-Boulder Lake association	1,115	0.1
721	Paranat silt loam, drained, occasionally flooded	755	0.1
731	Ados Variant-Pie Creek Variant-Jesse Camp association	4,351	0.3
741	Creemon-Relley association	3,350	0.2
762	Shagnasty-Softscrabble association	24,255	1.6
764	Shagnasty-Ravenswood-Rock outcrop association	15,369	1.0
770	Welch loam, drained, 0 to 4 percent slopes	4,093	0.3
771	Welch gravelly silt loam, drained, 2 to 8 percent slopes	215	*
772	Welch silt loam, 0 to 2 percent slopes	646	*
781	Walti-Softscrabble-Chad association	4,945	0.3
782	Walti-Softscrabble-Robson association	6,332	0.4
783	Walti-Glean association	2,322	0.2
801	Freznik-Quarz-Jivas association	4,540	0.3
802	Freznik-Whitepeak association	3,085	0.2
811	Quarz-Highams-Atrypa Variant association	7,025	0.5
812	Quarz-Bregar-Duff association	7,045	0.5
813	Quarz-Chen-Duff association	10,895	0.7
814	Quarz-Duff association	2,070	0.1
821	Enko loam, 0 to 2 percent slopes	1,385	0.1
822	Enko-Davey-McConnel association	9,240	0.6
823	Enko-Puett association	7,290	0.5
830	Atrypa gravelly loam, 30 to 50 percent slopes	14,556	1.0
831	Atrypa-Mau association	10,493	0.7
841	Kodra loam, 0 to 4 percent slopes	5,610	0.4
851	Glean-Gando association	3,712	0.3
861	Zineb gravelly loam, 2 to 8 percent slopes	14,515	1.0

See footnote at end of table.

TABLE 164.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
870	Fortank very stony loam, 4 to 8 percent slopes	11,489	0.8
871	Fortank association	1,880	0.1
881	Batan-Ocala association	63,060	4.3
883	Batan silt loam	1,150	0.1
891	Whitepeak-Quarz-Softscrabble association	6,070	0.4
901	Tenabo-Ricert association	7,060	0.5
922	Handy loam, 2 to 8 percent slopes	11,726	0.8
923	Handy-Rubyhill association	2,205	0.1
941	Short Creek association	7,685	0.5
951	Donna-Stampede association	4,780	0.3
961	Weigle-Pedoli Variant association	1,545	0.1
962	Weigle gravelly loam, 15 to 30 percent slopes	4,250	0.3
971	Bregar-Fortank-Jivas association	5,040	0.3
972	Bregar-Jivas-Duff association	42,175	2.9
975	Bregar Variant-Hymas-Quarz association	1,115	0.1
981	Ebic-Ziram-Jivas association, moderately steep	1,770	0.1
982	Ebic-Ziram-Jivas association, steep	7,650	0.5
991	Fertaline-Handy association	7,872	0.5
1001	Solak-Highams-Hymas association	4,830	0.3
1010	Bubus loam, 0 to 2 percent slopes	15,089	1.0
1011	Bubus very fine sandy loam, slightly saline-alkali, 2 to 8 percent slopes	1,008	0.1
1012	Bubus-Dianev association	3,508	0.2
1022	Nevador-Ricert-Tulase association	3,201	0.2
1060	Allker gravelly sandy loam, 2 to 8 percent slopes	12,255	0.8
1201	Tulase silt loam, 2 to 8 percent slopes	10,242	0.7
1202	Tulase silt loam, 0 to 2 percent slopes	12,341	0.8
1203	Tulase-Bubus-McConnel association	10,663	0.7
1232	Perwick-Tulase association	23,129	1.6
1233	Perwick-Puett-Tulase association	28,181	1.9
1281	Wendane silt loam, frequently flooded	1,535	0.1
1282	Wendane-Playa association	360	*
1291	Perwick Variant association	387	*
1352	Cortez-Tenvorrd association	11,285	0.8
1411	Pineval-Tulase-Perwick association	65,809	4.5
1500	Playas	366	*
	Total	1,470,948	100.0

* Less than 0.1 percent.

TABLE 165.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Ados	Loamy-skeletal, carbonatic, frigid Xerollic Paleorthids
Ados Variant	Loamy-skeletal, carbonatic, frigid Xerollic Paleorthids
Akercan	Fine-loamy, mixed, frigid Xerollic Camborthids
Akerue	Clayey-skeletal, montmorillonitic, frigid, shallow Xerollic Durargids
Allker	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Durixerollic Haplargids
Ansping	Loamy-skeletal, carbonatic, frigid Aridic Calcixerolls
Atrypa	Loamy, mixed, frigid, shallow Calciorthidic Haploxerolls
Atrypa Variant	Fine-loamy, mixed, frigid Aridic Haploxerolls
Barrier	Loamy, mixed, frigid, shallow Haploxerollic Durorthids
Batan	Fine-silty, mixed (calcareous), mesic Durorthidic Torriorthents
Beanflat	Coarse-loamy, mixed (calcareous), frigid Aeric Halaquepts
Boulder Lake	Fine, montmorillonitic, frigid Aquic Chromoxererts
Bregar	Loamy-skeletal, mixed, frigid Lithic Xerollic Haplargids
Bregar Variant	Loamy-skeletal, mixed, frigid Lithic Xerollic Haplargids
Brinnum	Fine-silty, mixed (calcareous), mesic Typic Halaquepts
Broyles	Coarse-loamy, mixed, mesic Duric Camborthids
Bubus	Coarse-loamy, mixed (calcareous), mesic Durorthidic Torriorthents
Cavehill	Loamy-skeletal, carbonatic, frigid Typic Calcixerolls
Chad	Fine, mixed, frigid Aridic Argixerolls
Chen	Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls
*Cherry Spring	Fine-loamy, mixed, mesic Haploxerollic Durargids
Cherry Spring Variant	Loamy, mixed, mesic, shallow Xerollic Durargids
Cleavage	Loamy-skeletal, mixed, frigid Lithic Argixerolls
Clowfin	Loamy-skeletal, mixed (calcareous), mesic Typic Torriorthents
Coils	Fine, montmorillonitic, frigid Haploxerollic Durargids
Cortez	Fine, montmorillonitic, mesic Xerollic Nadurargids
Creemon	Coarse-silty, mixed, mesic Duric Camborthids
Davey	Sandy, mixed, mesic Xerollic Camborthids
Decram	Loamy-skeletal, mixed Typic Cryoborolls
Decram Variant	Loamy-skeletal, mixed Argic Cryoborolls
Dianev	Fine-silty, mixed (calcareous), frigid Aeric Halaquepts
*Donna	Very-fine, montmorillonitic, frigid Abruptic Aridic Durixerolls
Duff	Fine-loamy, mixed Pachic Cryoborolls
Ebic	Clayey-skeletal, montmorillonitic, frigid Typic Palexerolls
Eightmile	Loamy-skeletal, mixed, nonacid, frigid, shallow Xeric Torriorthents
Enko	Coarse-loamy, mixed, mesic Durixerollic Camborthids
Fenster	Fine-silty, mixed (calcareous), frigid Typic Torriorthents
Fertaline	Fine, montmorillonitic, frigid Abruptic Xerollic Durargids
Fortank	Fine, montmorillonitic, frigid Xerollic Haplargids
Foxmount	Loamy-skeletal, mixed Typic Cryoborolls
Freznik	Fine, montmorillonitic, frigid Xerollic Paleargids
Gando	Loamy-skeletal, mixed, frigid Lithic Haploxerolls
Glean	Loamy-skeletal, mixed, frigid Pachic Haploxerolls
Granzan	Loamy-skeletal, carbonatic, frigid Typic Calcixerolls
Granzan Variant	Loamy-skeletal, mixed, frigid Typic Calcixerolls
Hackwood	Fine-loamy, mixed Pachic Cryoborolls
Handy	Fine, montmorillonitic, frigid Xerollic Haplargids
Hapgood	Loamy-skeletal, mixed Pachic Cryoborolls
Hatur	Loamy-skeletal, carbonatic Cryic Rendolls
Haunchee	Loamy-skeletal, carbonatic Cryic Lithic Rendolls
Hayeston	Coarse-loamy, mixed (calcareous), frigid Xeric Torriorthents
Highams	Loamy-skeletal, carbonatic, frigid Lithic Xeric Torriorthents
Highams Variant	Loamy-skeletal, carbonatic, frigid, shallow Xerollic Calciorthids
Hodedo	Fine, montmorillonitic, frigid Aridic Durixerolls
Hopeka	Loamy-skeletal, carbonatic, frigid Lithic Xeric Torriorthents
Humboldt	Fine, montmorillonitic (calcareous), mesic Fluvaquentic Haplaquolls
Hymas	Loamy-skeletal, carbonatic, frigid Lithic Haploxerolls
Jesse Camp	Fine-silty, mixed, frigid Xerollic Camborthids
Jivas	Loamy-skeletal, mixed, frigid Aridic Argixerolls
Kobeh	Loamy-skeletal, mixed, frigid Durixerollic Camborthids
Kodra	Coarse-loamy, mixed, mesic Haploxerollic Durorthids
Kodra Variant	Loamy, mixed, mesic, shallow Typic Durorthids
Labshaft	Loamy-skeletal, mixed Lithic Cryoborolls
Lien	Loamy-skeletal, mixed, frigid, shallow Xerollic Durorthids
Loncan	Loamy-skeletal, mixed, frigid Aridic Haploxerolls

TABLE 165.--CLASSIFICATION OF THE SOILS--Continued

Soil name	Family or higher taxonomic class
Loncan Variant	Fine-loamy, mixed, mesic Aridic Duric Haploxerolls
Lopwash	Loamy-skeletal, mixed, frigid Typic Camborthids
Maghills	Loamy-skeletal, carbonatic, frigid Typic Torriorthents
Mau	Clayey-skeletal, montmorillonitic, frigid Durixerollic Haplargids
McConnel	Sandy-skeletal, mixed, mesic Xerollic Camborthids
Molion	Loamy-skeletal, mixed, frigid, shallow Haploxerollic Durorthids
Mosquet	Clayey, montmorillonitic Lithic Ruptic-Argic Cryoborolls
Nadra	Loamy, mixed, frigid, shallow Entic Durorthids
Needle Peak	Fine-silty, mixed (calcareous), mesic Aquic Torriorthents
Nevador	Fine-loamy, mixed, mesic Durixerollic Haplargids
Nuc	Loamy-skeletal, carbonatic, frigid Durixerollic Calciorthids
Ocala	Fine-silty, mixed (calcareous), mesic Aeric Halaquepts
Paranat	Fine-silty, mixed (calcareous), mesic Fluvaquentic Haplaquolls
Pedoli	Fine-loamy, mixed, frigid Xerollic Haplargids
Pedoli Variant	Fine-loamy, mixed, frigid Xerollic Haplargids
Perwick	Coarse-loamy, mixed (calcareous), mesic Xeric Torriorthents
Perwick Variant	Loamy-skeletal, mixed (calcareous), mesic Xeric Torriorthents
Pie Creek	Very-fine, montmorillonitic, frigid Aridic Palexerolls
Pie Creek Variant	Loamy-skeletal, carbonatic, frigid Aridic Petrocalcic Palexerolls
Piltdown	Coarse-loamy, mixed (calcareous), mesic Typic Torriorthents
Pineval	Loamy-skeletal, mixed, mesic Durixerollic Haplargids
Poorcal	Coarse-loamy, mixed, frigid Durixerollic Calciorthids
Puett	Loamy, mixed (calcareous), mesic, shallow Xeric Torriorthents
Pumper	Sandy-skeletal, mixed, mesic Typic Camborthids
Quarz	Clayey-skeletal, montmorillonitic, frigid Aridic Argixerolls
Ramires	Fine, montmorillonitic, frigid Aridic Calcic Argixerolls
Ravenswood	Clayey-skeletal, montmorillonitic, frigid Typic Argixerolls
Relley	Fine-silty, mixed, mesic Duric Camborthids
Ricert	Fine-loamy, mixed, mesic Duric Natrargids
Robson	Clayey-skeletal, montmorillonitic, frigid Lithic Xerollic Haplargids
Rubyhill	Fine-loamy, mixed, frigid Haploxerollic Durorthids
Rutab	Loamy-skeletal, mixed, frigid Xerollic Camborthids
Shagnasty	Fine, montmorillonitic, frigid Typic Argixerolls
Shipley	Coarse-loamy, mixed (calcareous), frigid Xeric Torriorthents
Short Creek	Clayey-skeletal, montmorillonitic, frigid Xerollic Haplargids
Silverado	Coarse-loamy, mixed, frigid Durixerollic Camborthids
Simpark	Loamy-skeletal, mixed, frigid, shallow Xerollic Durargids
Singletree	Fine-loamy, mixed, frigid Aridic Calcic Argixerolls
Singletree Variant	Fine-loamy, mixed, frigid Calciorthidic Haploxerolls
Softscrabble	Loamy-skeletal, mixed, frigid Pachic Argixerolls
*Solak	Loamy-skeletal, mixed (calcareous), frigid Lithic Xeric Torriorthents
Sonoma	Fine-silty, mixed (calcareous), mesic Aeric Fluvaquents
Sonoma Variant	Coarse-silty, mixed (calcareous), mesic Typic Fluvaquents
Soughe	Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids
Soughe Variant	Clayey, montmorillonitic, frigid, shallow Xerollic Haplargids
Spinlin	Clayey-skeletal, montmorillonitic Argic Cryoborolls
*Stampede	Fine, montmorillonitic, frigid Aridic Durixerolls
Tenabo	Loamy, mixed, mesic, shallow Typic Nadurargids
Tenvorrd	Loamy, mixed, mesic, shallow Xerollic Durorthids
Toeja	Fine-loamy, mixed, frigid Aridic Argixerolls
Tomera	Fine, montmorillonitic, mesic Xerollic Natrargids
Tulase	Coarse-silty, mixed (calcareous), mesic Durorthidic Xeric Torriorthents
*Umil	Loamy, mixed, frigid, shallow Xerollic Durorthids
Valcrest	Fine, montmorillonitic, mesic Xerollic Natrargids
Walti	Fine, montmorillonitic, frigid Aridic Argixerolls
Weigle	Loamy, mixed, frigid, shallow Xerollic Durorthids
Welch	Fine-loamy, mixed, frigid Cumulic Haplaquolls
Wendane	Fine-silty, mixed (calcareous), mesic Aeric Halaquepts
Whirlo	Loamy-skeletal, mixed, mesic Typic Camborthids
Whitepeak	Clayey-skeletal, montmorillonitic, frigid Xerollic Haplargids
Wholan	Coarse-silty, mixed, mesic Typic Camborthids
Winu	Fine-loamy, mixed Argic Pachic Cryoborolls
Zineb	Loamy-skeletal, mixed, mesic Durixerollic Camborthids
Ziram	Clayey-skeletal, montmorillonitic, frigid Typic Palexerolls

Appendix

This appendix consists of materials, extracted from various sources, that provided the basis for many of the interpretive ratings given in this soil survey. These materials are as follows.

Table 603-14. Daily cover for landfill
Table 603-15. Shallow excavations
Table 603-19. Local roads and streets
Table 603-21. Roadfill
Table 603-22. Sand
Table 603-23. Gravel
Table 603-24. Topsoil
Table 603-26. Pond reservoir area
Table 603-27. Embankment, dikes, and levees
Table 603-29. Drainage
Table 603-30. Irrigation
Table 603-31. Terraces and diversions
Guide for rating soils according to their relative suitability for range seedings in Nevada
Guide for estimating erosion hazard (bare soil) - in Nevada
Classification of bolson landforms

Table 603-14. Daily cover for landfill.

PROPERTY	LIMITS			RESTRICTIVE FEATURE
	GOOD	FAIR	POOR	
1. USDA TEXTURE	---	---	ICE	PERMAFROST
2. DEPTH TO BEDROCK (IN)	>60	40-60	<40	DEPTH TO ROCK
3. DEPTH TO CEMENTED PAN (IN)	>60	40-60	<40	CEMENTED PAN
4. 6/UNIFIED	---	---	SP, SW, SP-SM, SW-SM, GP, GW, GP-GM, GW-GM	SEEPAGE
5. 4/, 5/, 6/USDA TEXTURE	---	CL, SICL, SC	SIC, C	TOO CLAYEY
6. 6/USDA TEXTURE	---	LCOS, LS, LFS, VFS	S, FS, COS, SG	TOO SANDY
7. 5/, 6/UNIFIED	---	---	OL, OH, CH, MH	HARD TO PACK
8. 6/, 8/COARSE FRAGMENTS (PCT)	<25	25-50	>50	SMALL STONES
9. 6/, 8/FRACTION >3 IN (WT PCT)	<25	25-50	>50	LARGE STONES
10. SLOPE (PCT)	<8	8-15	>15	SLOPE
11. DEPTH TO HIGH WATER TABLE (FT)	--- >3.5	--- 1.5-3.5	+ <1.5	PONDING WETNESS
12. 6/UNIFIED	---	---	PT	EXCESS HUMUS
13. LAYER THICKNESS (IN)	>60	40-60	<40	THIN LAYER
14. 6/SOIL REACTION (pH)	---	---	<3.6	TOO ACID
15. 4/SALINITY (MMHOS/CM) (0-60")	---	---	>16	EXCESS SALT
16. 4/, 6/SODIUM ADSORPTION RATIO OR GREAT GROUP OR PHASE	---	---	>12 (HALIC, NATRIC, ALKALI PHASES)	EXCESS SODIUM
17. CARBONATES	---	---	VI/	EXCESS LIME

4/Disregard (1) in all Aridisols except Salorthids and Aquic subgroups, (2) all Aridic subgroups, and (3) all Torri great groups of Entisols except Aquic subgroups.

5/If in kaolinitic family, rate one class better if experience confirms.

6/Thickest layer between 10 and 60 inches.

8/Sum (100-% passing No. 10 sieve) and fraction >3 in. Use dominant condition for restrictive feature.

VI/If amount of carbonate is so high that it restricts the growth of plants, rate "POOR-EXCESS LIME."

Table 603-15. Shallow excavations.

PROPERTY	LIMITS			RESTRICTIVE FEATURE
	SLIGHT	MODERATE	SEVERE	
1. USDA TEXTURE	---	---	ICE	PERMAFROST
2. DEPTH TO BEDROCK (IN):				DEPTH TO ROCK
HARD	>60	40-60	<40	
SOFT	>40	20-40	<20	
3. DEPTH TO CEMENTED PAN (IN):				CEMENTED PAN
THICK	>60	40-60	<40	
THIN	>40	20-40	<20	
4. USDA TEXTURE (20-60")	---	VII/ SI	COS, S, FS, VFS, LCOS, LS, LFS, LVFS, G, SG	CUTBANKS CAVE
5. USDA TEXTURE (20-60")	---	C, SIC	---	TOO CLAYEY
6. SOIL ORDER	---	---	VERTISOLS	CUTBANKS CAVE
7. BULK DENSITY (G/CC) (20-60)	---	>1.8	---	DENSE LAYER
8. UNIFIED (20-60")	---	---	OL, OH, PT	EXCESS HUMUS
9. 1/FRACTION >3 IN (WT PCT)	<25	25-50	>50	LARGE STONES
10. DEPTH TO HIGH WATER TABLE (FT)	---	---	+	PONDING
	>6	2.5-6	<2.5	WETNESS
11. FLOODING	NONE, RARE	COMMON	---	FLOODING
12. SLOPE (PCT)	<8	8-15	>15	SLOPE
13. DOWNSLOPE MOVEMENT	---	---	II/	SLIPPAGE

1/Weighted average to 40 inches.

II/If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate "SEVERE-SLIPPAGE."

VII/If loess, rating should be SLIGHT.

Table 603-19. Local roads and streets.

PROPERTY	LIMITS			RESTRICTIVE FEATURE
	SLIGHT	MODERATE	SEVERE	
1. USDA TEXTURE	---	---	ICE	PERMAFROST
2. TOTAL SUBSIDENCE	---	---	>12	SUBSIDES
3. DEPTH TO BEDROCK (IN):				DEPTH TO ROCK
HARD	>40	20-40	<20	
SOFT	>20	<20	---	
4. DEPTH TO CEMENTED PAN (IN):				CEMENTED PAN
THICK	>40	20-40	<20	
THIN	>20	<20	---	
5. 9/SHRINK-SWELL	LOW	MODERATE	HIGH, VERY HIGH	SHRINK-SWELL
6. 5/, 9/, 10/ASSHTO GROUP INDEX NUMBER	<5	5-8	>8	LOW STRENGTH
7. DEPTH TO HIGH WATER TABLE (FT)	---	---	+	PONDING
	>2.5	1.0-2.5	<1.0	WETNESS
8. SLOPE (PCT)	<8	8-15	>15	SLOPE
9. FLOODING	NONE	RARE	COMMON	FLOODING
10. POTENTIAL FROST ACTION	LOW	MODERATE	HIGH	FROST ACTION
11. 1/FRACTION >3 IN (WT PCT)	<25	25-50	>50	LARGE STONES
12. DOWNSLOPE MOVEMENT	---	---	II/	SLIPPAGE
13. FORMATION OF PITS	---	---	III/	PITTING
14. DIFFERENTIAL SETTLING	---	---	V/	UNSTABLE FILL

1/Weighted average to 40 inches.
5/If in kaolinitic family, rate one class better if experience confirms.
9/Thickest layer between 10 and 40 inches.
10/GIN=(F-35)[.2+.005(LL-40]+.01(F-15)(PI-10) where F=% passing No. 200 sieve. If F<35 and PI>11, use only part 2 of equation. Use median values.
II/If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate "SEVERE-SLIPPAGE."
III/If the soil is susceptible to the formation of pits caused by the melting of ground ice when the ground cover is removed, rate "SEVERE-PITTING."
IV/If the soil is susceptible to differential settling, rate "SEVERE-UNSTABLE FILL."

Table 603-21. Roadfill.

PROPERTY	LIMITS GOOD	FAIR	POOR	RESTRICTIVE FEATURE
1. USDA TEXTURE	---	---	ICE	PERMAFROST
2. DEPTH TO BEDROCK (IN)	>60	40-60	<40	DEPTH TO ROCK
3. DEPTH TO CEMENTED PAN (THICK) (IN)	>60	40-60	<40	CEMENTED PAN
4. 12/SHRINK-SWELL	LOW	MODERATE	HIGH, VERY HIGH	SHRINK-SWELL
5. 5/, 10/, 12/ASSHTO GROUP INDEX NUMBER	<5	5-8	>8	LOW STRENGTH
6. LAYER THICKNESS (IN)	>60	30-60	<30	THIN LAYER
7. 1/FRACTION >3 IN (WT PCT)	<25	25-50	>50	LARGE STONES
8. DEPTH TO HIGH WATER TABLE (FT)	>3	1-3	<1	WETNESS
9. SLOPE (PCT)	<15	15-25	>25	SLOPE

1/Weighted average to 40 inches.

5/If in kaolinitic family, rate one class better if experience confirms.

10/GIN=(F-35)[.2+.005(LL-40)]+.01(F-15)(PI-10) where F=% passing. No. 200 sieve. If F<35 and PI>11, use only part 2 of equation. Use median values.

12/Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on bottom layer, verify thickness.

XVIII/If the content of gypsum is 10 to 15 percent, rate "FAIR-EXCESS GYPSUM." If it exceeds 15 percent, rate "POOR-EXCESS GYPSUM."

Table 603-22. Sand.

PROPERTY	LIMITS		RESTRICTIVE FEATURE
	PROBABLE SOURCE	IMPROBABLE SOURCE	
1. USDA TEXTURE	---	ICE	PERMAFROST
2. 12/UNIFIED	SW, SP, SW-SM, SP-SM		
	13/GW, 13/GP 13/GW-GM, 13/GP-GM		
		14/GW, 14/GP, 14/GW-GM 14/GP-GM	SMALL STONES
		PT	EXCESS HUMUS
		ALL OTHER	EXCESS FINES
3. LAYER THICKNESS (IN)	>36	<36	THIN LAYER
4. 6/FRACTION >3 IN (WT PCT)	<50	>50	LARGE STONES

6/Thickest layer between 10 and 60 inches.
12/Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on bottom layer, verify thickness.
13/% passing No. 4 sieve minus % passing No. 200 sieve >25.
14/% passing No. 4 sieve minus % passing No. 200 sieve <25.

Table 603-23. Gravel.

PROPERTY	LIMITS		RESTRICTIVE FEATURE
	PROBABLE SOURCE	IMPROBABLE SOURCE	
1. USDA TEXTURE	---	ICE	PERMAFROST
2. 12/UNIFIED	GW, GP, GW-GM, GP-GM		
	15/SW, 15/SP, 15/SW-SM, 15/SP-SM		
		16/SW, 16/SP, 16/SW-SM, 16/SP-SM	TOO SANDY
		PT	EXCESS HUMUS
		ALL OTHER	EXCESS FINES
3. LAYER THICKNESS (IN)	>36	<36	THIN LAYER
4. 6/FRACTION >3 IN (WT PCT)	<50	>50	LARGE STONES

6/Thickest layer between 10 and 60 inches.

12/Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on bottom layer, verify thickness.

15/100 minus % passing No. 4 sieve >25.

16/100 minus % passing No. 4 sieve <25.

Table 603-24. Topsoil.

PROPERTY	LIMITS			RESTRICTIVE FEATURE
	GOOD	FAIR	POOR	
1. USDA TEXTURE	---	---	ICE	PERMAFROST
2. DEPTH TO BEDROCK (IN)	>40	20-40	<20	DEPTH TO ROCK
3. DEPTH TO CEMENTED PAN (IN)	>40	20-40	<20	CEMENTED PAN
4. DEPTH TO BULK DENSITY >1.8 (G/CC) (IN)	>40	20-40	<20	AREA RECLAIM
5. 17/USDA TEXTURE	---	LCOS, LS, LFS, LVFS	COS, S, FS, VFS	TOO SANDY
6. 17/USDA TEXTURE	---	18/SCL, 18/CL, 18/SICL	SCI, C, SC	TOO CLAYEY
7. 17/USDA TEXTURE	---	---	FB, HM, SP, MPT, MUCK, PEAT, CE	EXCESS HUMUS
8. 8/FRACTION >3 IN (WT PCT):				
(0-40")	<5	5-25	>25	LARGE STONES
(40-60")	<15	15-30	>30	AREA RECLAIM
9. 8/COARSE FRAGMENTS (PCT):				
(0-40")	<5	5-25	>25	SMALL STONES
(40-60")	<25	25-50	>50	AREA RECLAIM
10. 17/SALINITY (MMHOS/CM)	<4	4-8	>8	EXCESS SALT
11. LAYER THICKNESS (IN)	>40	20-40	<20	THIN LAYER
12. DEPTH TO HIGH WATER TABLE (FT)	---	---	<1	WETNESS
13. SODIUM ADSORPTION RATIO (0-40") OR GREAT GROUP OR PHASE	---	---	>12 (HALIC, NATRIC, ALKALI PHASES)	EXCESS SODIUM
14. 17/SOIL REACTION (pH)	---	---	<3.6	TOO ACID
15. SLOPE (PCT)	<8	8-15	>15	SLOPE
16. CARBONATES	---	---	VI/	EXCESS LIME

8/Sum (100-% passing No. 10 sieve) and fraction >3 in. Use dominate condition for restrictive feature.

17/Thickest layer between 0 and 40 inches.

18/If soil contains >3% organic matter and has less than 35% clay, rate GOOD.

VI/If the amount of carbonate is so high that it restricts the growth of plants, rate "POOR-EXCESS LIME."

Table 603-26. Pond reservoir area.

PROPERTY	LIMITS			RESTRICTIVE FEATURE
	SLIGHT	MODERATE	SEVERE	
1. USDA TEXTURE	---	---	ICE	PERMAFROST
2. PERMEABILITY (IN/HR) (20-60")	<0.6	0.6-2.0	>2.0	SEEPAGE
3. DEPTH TO BEDROCK (IN)	>60	20-60	<20	DEPTH TO ROCK
4. DEPTH TO CEMENTED PAN (IN)	>60	20-60	<20	CEMENTED PAN
5. SLOPE (PCT)	<3	3-8	>8	SLOPE
6. USDA TEXTURE (ALL DEPTHS)	---	---	MARL, GYP	SEEPAGE
7. DOWNSLOPE MOVEMENT	---	---	II/	SLIPPAGE
8. FORMATION OF PITS	---	---	III/	PITTING

II/If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate "SEVERE-SLIPPAGE."

III/If the soil is susceptible to the formation of pits caused by the melting of ground ice when the surface cover is removed, rate "SEVERE-PITTING."

Table 603-27. Embankment, dikes, and levees.

PROPERTY	LIMITS			RESTRICTIVE FEATURE
	SLIGHT	MODERATE	SEVERE	
1. USDA TEXTURE	---	---	ICE	PERMAFROST
2. LAYER THICKNESS (IN)	>60	30-60	<30	THIN LAYER
3. 6/UNIFIED	---	---	GW, GP, SW, SP, GW-GM, GP-GM, SW-SM, SP-SM, 19/SM, 19/GM	SEEPAGE
4. 6/UNIFIED	---	20/GM, 21/CL	22/ML, 23/SM, 23/SP, CL-ML	PIPING
5. 6/UNIFIED	---	---	PT, OL, OH	EXCESS HUMUS
6. 6/UNIFIED	---	---	MH, 24/CH	HARD TO PACK
7. 1/FRACTION >3 IN (WT PCT)	<15	15-35	>35	LARGE STONES
8. DEPTH TO HIGH WATER TABLE (FT) APPARENT PERCHED	--- >4.0 >3.0	--- 2.0-4.0 1.0-3.0	+ <2.0 <1.0	PONDING WETNESS WETNESS
9. SODIUM ADSORPTION RATIO (0-40") OR GREAT GROUP OR PHASE	---	---	>12 (NATRIC, HALIC, ALKALI PHASES)	EXCESS SODIUM
10. SALINITY (MMHOS/CM) (ANY DEPTH)	<8	8-16	>16	EXCESS SALT

1/Weighted average to 40 inches.

6/Thickest horizon between 10 and 60 inches.

19/Rate MODERATE if >20% passing No. 200 sieve and SLIGHT if >30% passing No. 200 sieve.

20/Rate SLIGHT if <35% passing No. 200 sieve and <50% passing No. 40 sieve and <65% passing No. 10 sieve.

21/Rate SLIGHT if PI>15.

22/Rate MODERATE if PI>10.

23/Rate MODERATE if <70% passing No. 40 sieve and <90% passing No. 10 sieve, and rate SLIGHT if <60% passing No. 40 sieve and <75% passing No. 10 sieve.

24/Rate MODERATE if PI<40.

XIX/If the content of gypsum is 5 to 10 percent, rate "MODERATE-EXCESS GYPSUM." If it exceeds 10 percent, rate "SEVERE-EXCESS GYPSUM."

Table 603-29. Drainage.

PROPERTY	LIMITS	RESTRICTIVE FEATURE
1. USDA TEXTURE	ICE	PERMAFROST
2. 26/DEPTH TO HIGH WATER TABLE (PT)	IX/ >3 +	DEPTH TO WATER PONDING
3. PERMEABILITY (IN/HR) (0-40")	<0.2	PERCS SLOWLY
4. DEPTH TO BEDROCK (IN)	<40	DEPTH TO ROCK
5. DEPTH TO CEMENTED PAN (IN)	<40	CEMENTED PAN
6. FLOODING	COMMON	FLOODING
7. TOTAL SUBSIDENCE	ANY ENTRY	SUBSIDES
8. 6/FRACTION >3 IN (WT PCT)	>25	LARGE STONES
9. POTENTIAL FROST ACTION	HIGH	FROST ACTION
10. SLOPE (PCT)	>3	SLOPE
11. 6/USDA TEXTURE	COS, S, FS, VFS, LCOS, LS, LFS, LVFS, SG, G	CUTBANKS CAVE
12. SALINITY (MMHOS/CM) (ANY DEPTH)	>8	EXCESS SALT
13. SODIUM ADSORPTION RATIO (0-40") OR GREAT GROUP OR PHASE)	>12 (NATRIC, HALIC, ALKALI PHASES)	EXCESS SODIUM
14. SULFIDIC MATERIALS (GREAT GROUP)	SULFAQUENTS, SULFIHEMISTS	EXCESS SULFUR
15. SOIL REACTION (pH) (ANY DEPTH)	<3.6	TOO ACID
16. DOWNSLOPE MOVEMENT	X/	SLIPPAGE
17. COMPLEX LANDSCAPE	XI/	COMPLEX SLOPE
18. AVAILABILITY OF OUTLETS	XII/	POOR OUTLETS
19.	NONE OF ABOVE	FAVORABLE

6/Thickest layer between 10 to 60 inches.
26/If DEEP TO WATER, disregard other properties.
IX/If irrigated, consider other restrictive features if the water table is between 3 and 5 feet.
X/If the soil is susceptible to movement downslope when loaded, excavated, or wet, list "SLIPPAGE" as a restrictive feature.
XI/If complex and irregular slopes cause difficulty in design, installation, or functioning of the system, list "COMPLEX SLOPE" as a restrictive feature.
XII/If good outlets are difficult to find, list "POOR OUTLETS" as a restrictive feature.

Table 603-30. Irrigation.

PROPERTY	LIMITS	RESTRICTIVE FEATURE
1. USDA TEXTURE	ICE	PERMAFROST
2. SLOPE (PCT)	>3	SLOPE
3. 1/FRACTION >3 IN (WT PCT)	>25	LARGE STONES
4. DEPTH TO HIGH WATER TABLE (FT)	+ XIII/ <3	PONDING WETNESS
5. 1/AVAILABLE WATER CAPACITY (IN/IN)	<0.10	DROUGHTY
6. USDA TEXTURE (SURFACE LAYER)	COS, S, FS, VFS, LCOS, LS, LFS, LVFS,	FAST INTAKE
7. USDA TEXTURE (SURFACE LAYER)	SIC, C, SC	SLOW INTAKE
8. WIND ERODIBILITY GROUP	1, 2, 3	SOIL BLOWING
9. PERMEABILITY (IN/HR) (0-60")	<0.2	PERCS SLOWLY
10. DEPTH TO BEDROCK (IN)	<40	DEPTH TO ROCK
11. DEPTH TO CEMENTED PAN (IN)	<40	CEMENTED PAN
12. FRAGIPAN (GREAT GROUP)	ALL FRAGI	ROOTING DEPTH
13. BULK DENSITY (G/CC) (0-40")	>1.7	ROOTING DEPTH
14. EROSION FACTOR (K) (SURFACE LAYER)	>.35	ERODES EASILY
15. FLOODING	COMMON	FLOODING
16. SODIUM ADSORPTION RATIO (0-40") OR GREAT GROUP OR PHPASE	>12 (NATRIC, HALIC, ALKALI PHASES)	EXCESS SODIUM
17. SALINITY (MMHOS/CM) (0-40")	>4	EXCESS SALT
18. SOIL REACTION (pH) (ANY DEPTH)	<3.6	TOO ACID
19. COMPLEX LANDSCAPE	XI/	COMPLEX SLOPE
20. FORMATION OF PITS	XIV/	PITTING
21. CARBONATES	XV/	EXCESS LIME
22.	NONE OF ABOVE	FAVORABLE

1/Weighted average to 40 inches.
XI/If complex and irregular slopes cause difficulty in design, installation, or functioning of the system, list "COMPLEX SLOPE" as a restrictive feature.
XIII/Disregard if depth to water table is below 3 feet during growing season.
XIV/If the soil is susceptible to the formation of pits caused by the melting of ground ice when ground cover is removed, list "PITTING" as a restrictive feature.
XV/If the amount of carbonate is so high that it restricts the growth of plants, list "EXCESS LIME" as a restrictive feature.

Table 603-31. Terraces and diversions.

	PROPERTY	LIMITS	RESTRICTIVE FEATURE
1.	USDA TEXTURE	ICE	PERMAFROST
2.	SLOPE (PCT)	>8	SLOPE
3.	1/FRACTION >3 IN (WT PCT)	>15	LARGE STONES
4.	DEPTH TO BEDROCK (IN)	<40	DEPTH TO BEDROCK
5.	DEPTH TO CEMENTED PAN (IN)	<40	CEMENTED PAN
6.	EROSION FACTOR (K) (0-40")	>.35	ERODES EASILY
7.	DEPTH TO HIGH WATER TABLE (FT)	+ <3.0	PONDING WETNESS
8.	FRAGIPAN (GREAT GROUP)	ALL FRAGI	ROOTING DEPTH
9.	6/USDA TEXTURE	COS, S, FS, LS, LCOS, SG	TOO SANDY
10.	WIND ERODIBILITY GROUP	1, 2, 3	SOIL BLOWING
11.	6/PERMEABILITY (IN/HR)	<0.2	PERCS SLOWLY
12.	DOWNSLOPE MOVEMENT	X/	SLIPPAGE
13.	COMPLEX LANDSCAPE	XI/	COMPLEX SLOPE
14.	AVAILABILITY OF OUTLETS	XII/	POOR OUTLETS
15.		NONE OF ABOVE	FAVORABLE

1/Weighted average to 40 inches.
6/Thickest layer between 10 and 60 inches.
X/If the soil is susceptible to movement downslope when loaded, excavated, or wet, list "SLIPPAGE" as a restrictive feature.
XI/If complex and irregular slopes cause difficulty in design, installation, or functioning of the system, list "COMPLEX SLOPE" as a restrictive feature.
XII/If good outlets are difficult to find, list "POOR OUTLETS" as a restrictive feature.
XX/If the content of gypsum exceeds 5 percent, list "EXCESS GYPSUM" as a restrictive feature.

GUIDE FOR RATING SOILS ACCORDING TO THEIR RELATIVE SUITABILITY FOR RANGE SEEDINGS IN NEVADA

USDA-ARS, FS, SCS
USDI-BLM
UNR-AG. EXP. STA.

Soil Property	Limits			Restrictive feature
	Good	Fair	Poor	
Moisture regime.	Aquic, xeric, ustic, and xeric and ustic bordering on aridic or torric.	Aridic and torric bordering on aquic, xeric or ustic.	Aridic and torric.	Too arid
Effective moisture. 1/	>10 ins. (25 cm).	7-10 ins. (17.5-25 cm).	<7 ins. (17.5 cm).	Too arid
Available water capacity.	Surface 10 ins. (27 cm) >1.25 ins. (3.2 cm). Soil profile >4 ins. (10.2 cm).	Surface 10 ins. (25 cm) 0.75-1.25 ins. (1.9-3.2 cm). Soil profile 2.5-4 ins. (6.4-10.2 cm).	Surface 10 ins. (25 cm) <0.75 ins. (1.9 cm). Soil profile <2-5 ins. (6.4 cm).	Droughty
Texture surface 7 ins. (17.5 cm).	LVFS, COSL, SL, FSL, VFSL, L SIL, SCL, and CL SICL with <35% C.	VFS, LFS, SC, SIC, C and CL and SICL with >35% C.	LS, LCOS, FS, COS.	Too sandy Too clayey
Rock fragments in surface 7 ins. (17.5 cm).	GR <35%; CB <15%; ST <3%. Total rock fragments <35%.	GR <35%; CB 15-35%; ST 3-15%. Total rock fragments <35%.	GR >35%; CB 35%; ST >15%. Total rock fragments >35%.	Small stones Large stones
Depth to abrupt A-B texture boundary. 2/	>10 ins. (25 cm).	>10 ins. (25 cm).	<10 ins. (25 cm).	Rooting depth
Depth to bedrock or hardpan	>20 ins. (50 cm).	10-20 ins. (25-50 cm).	<10 ins. (25 cm).	Depth to rock Cemented pan
Electrical conductivity-saturation extract-25°C.	<2 mmhos/cm (0.2 s/m) in upper 20 ins. (50 cm).	2-4 mmhos/cm (0.2-0.4 s/m) in upper 10 ins. (25 cm) and 4-8 mmhos/cm (0.4-0.8 s/m) in 10-20 (25-50 cm).	>4 mmhos/cm (0.4 s/m) in upper 10 ins. (25 cm) and/or >8 mmhos/cm (0.8 s/m) in 10-20 ins. (25-50 cm).	Excess salts
Sodium adsorption-ratio	<8 in upper 20 ins. (50 cm).	8-13 in upper 10 ins. (25 cm) and <20 in 10-20 ins. (25-50 cm).	>13 in upper 10 ins. (25 cm) and/or >20 in 10-20 ins. (25-50 cm).	Excess sodium
K x % slope 3/	<4 4/; <6 5/	4-6 4/; 6-8 5/	>6 4/; >8 5/	Erodes easily
I x C 6/	<60	<60	>60	Soil blowing

GUIDE FOR RATING SOILS ACCORDING TO THEIR RELATIVE SUITABILITY FOR RANGE SEEDINGS IN NEVADA--Continued

USDA-ARS, FS, SCS
USDI-BLM
UNR-AG. EXP. STA.

Soil Property	Limits			Restrictive feature
	Good	Fair	Poor	
Soil surface morphological types. 7/	Types I & II >60%; Type IV <5%; or with mollic epipedon 8/	Types I & II >60%; Type IV <10% 8/	Type III <60%; Type IV >10%. 8/	Too crusty

1/ Moisture from precipitation, run-on, and groundwater budgeted to actual evapotranspiration.

2/ Rate Vertisols and Vertic subgroups as poor.

3/ Sheet and rill erosion hazard (bare soil).

4/ For ustic bordering on aridic or torric, and aridic or torric bordering on ustic moisture regimes.

5/ For xeric, xeric bordering on aridic or torric, and aridic or torric bordering on xeric moisture regimes.

6/ Wind erosion hazard (bare soil).

7/ See: (1) Final Report. Properties, Occurrence and Management of Soils with Vesicular Surface Horizons, 1977. Contract No. 52500-CT 5(N). USDI-BLM and UNR-Ag. Exp. Sta. Eckert, Peterson, Wood, and Blackburn; and (2) Final Report. Properties, Occurrence and Management of Soils with Vesicular Surface Horizons-Effects of Trampling on Seedling Emergence. 1979. Contract No. YA 512-CT 7-14. USDI-BLM and UNR-Ag. Exp. Sta. Stephens, Eckert, and Peterson.

8/ Soils without crusting morphology are to be included in Types I & II for rating.

USDA-SCS
Reno, NV
6/20/83

302.7(a)(1)(ii) Descriptive Legend - preparation of mapping unit descriptions

Guide for Estimating Erosion Hazard (BARE SOIL) - in Nevada.

	Water K x S (percent slope)	Wind I x C (climatic factor)
Slight	<4	<60
Moderate	4-8	60-100
High	>8	<100

CLASSIFICATION OF BOLSON LANDFORMS

.....landforms.....			.....parts of landforms.....	
I Major Physiographic Part	II Major Landform	III Component Landform	IV Landform Element	V Slope Component
Bounding Mountains . .	(not defined . . .	. . .	. . .	. . .
Piedmont Slope	Alluvial Fan	Fan Collar	Channel	
		Erosional Fan Remnant	Summit	
			Sideslope.....	Shoulder
				Backslope
				Footslope
		Inset Fan	Channel	
	Fan Piedmont	Erosional Fan Remnant	Summit	
			Sideslope.....	Shoulder
				Backslope
				Footslope
			Partial Ballena.....	Crest
				Shoulder
				Backslope
			Channel	
		Inset Fan	Channel	
		Fan Apron	Channel	
		Nonburied Fan Remnant	Channel	
	Fan Skirt	. . .	Channel	
Basin Floor (Bolson Floor)	Alluvial Flat	Alluvial Flat Remnant	Channel	
	Alluvial Plain			
	Sand Sheet	Sand Dune	Interdune Flat	
	Beach Plain	Offshore Bar		
		Barrier Bar		
		Lagoon	Channel	
	Lake Plain	Lake-Plain Terrace	Channel	
	Playa	Floodplain Playa	Channel	

CLASSIFICATION OF SEMIBOLSON LANDFORMS

.....landforms.....			.....parts of landforms.....	
I Major Physiographic Part	II Major Landform	III Component Landform	IV Landform Element	V Slope Component
Bounding Mountains . .	(not defined) . . .	. . .	. . .	. . .
Piedmont Slope	Ballena	. . .	. . .	Crest Shoulder Backslope Footslope
			Channel	
		Inset Fan	Channel	
	Alluvial Fan	Fan Collar	Channel	
		Erosional Fan Remnant	Summit	
			Sideslope.....	Shoulder Backslope Footslope
	Fan Piedmont	Erosional Fan Remnant	Summit	
			Sideslope.....	Shoulder Backslope Footslope
			Partial Ballena.....	Crest Shoulder Backslope Footslope
			Channel	
		Inset Fan	Channel	
		Fan Apron	Channel	
	Fan Skirt	. . .	Channel	
Basin Floor (Semibolson Floor)	Alluvial Flat	Alluvial Flat		
		Alluvial Flat Remnant	Channel	
			Channel	
	Alluvial Plain	Basin-Floor Remnant		
	Sand Sheet	Sand Dune		
	Axial-Stream Floodplain	Floodplain	Channel	
		Stream Terrace		

☆ U.S. GOVERNMENT PRINTING OFFICE : 1989 O - 183-529 : QL 3