SOIL SURVEY OF

GEORGE COUNTY, Mississippi

U. S. Department of Agriculture
Soil Conservation Service
In Cooperation With
Mississippi
Agricultural Experiment Station

Issued November 1971

Major fieldwork for this soil survey was done in the period 1962-66. Soil names and descriptions were approved in 1967. Unless otherwise indicated, statements in this publication refer to conditions in the county in 1967.

This survey was made by the Soil Conservation Service and Forest Service in cooperation with the Mississippi Agricultural Experiment Station. It is part of the technical assistance furnished to the Three Rivers Soil Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, United States Department of Agriculture, Washington, D. C. 20250

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of George County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil is described and the page for the woodland group, the woodland forage site, and the wildlife group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the woodland forage sites and woodland groups.

Foresters and others can refer to the section "Use of the Soils for Woodland," where the soils of the county are grouped according to their suitability for trees.

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Community planners and others can read about soil properties that affect the choice of sites for nonfarm uses and for recreation areas in the section "Town and Country Planning."

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Use of the Soils for Wildlife."

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in George County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the county given at the beginning of the publication.

Cover: Dairy cattle grazing in pecan orchard. The soil is McLaurin fine sandy loam, 0 to 2 percent slopes.

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SOIL SURVEY OF GEORGE COUNTY, MISSISSIPPI

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UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, AND FOREST SERVICE, IN COOPERATION WITH THE MISSISSIPPI AGRICULTURAL EXPERIMENT STATION

GEORGE COUNTY is in the southeastern part of Mississippi (fig. 1). It has a land area of 307,840 acres, or about 481 square miles. It is approximately 135 miles southeast of Jackson and about 40 miles northwest of Mobile, Alabama.

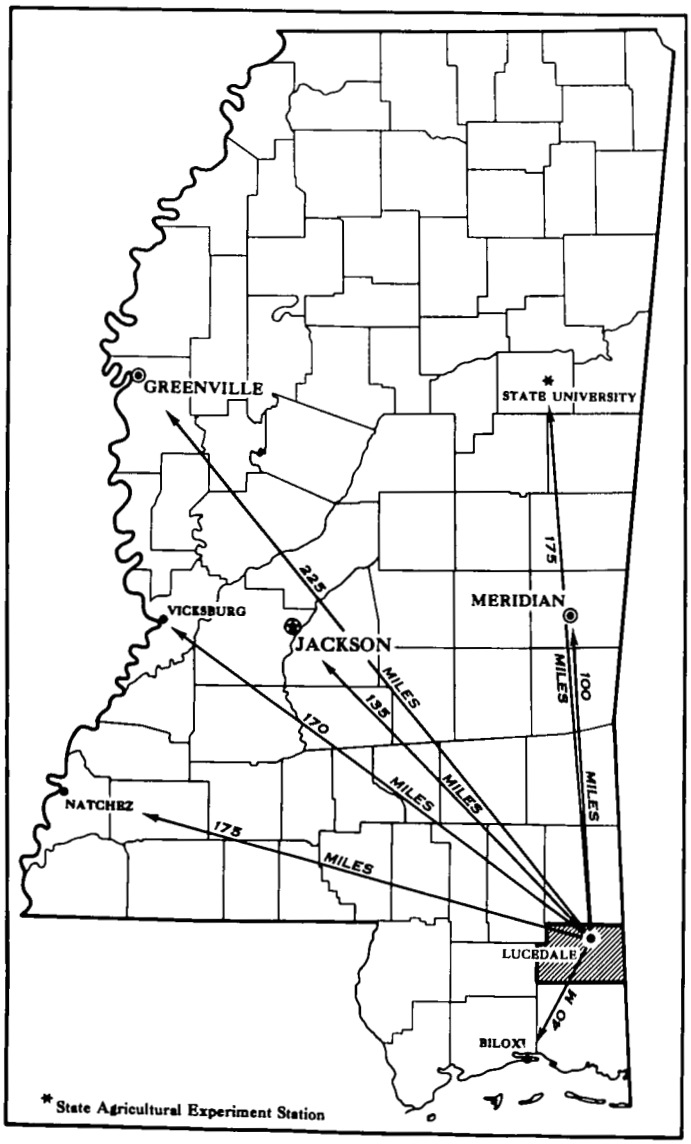


Figure 1.--Location of George County in Mississippi.

George County was formed by legislative act in 1910. It was created from two townships of Jackson County and one of Greene County. Lucedale became the county seat.

Many settlers came into the area late in the eighteenth century. Most of these people came by way of the Pascagoula River and were seeking farms. They built their homes mainly along the river.

At the beginning of the nineteenth century, sawmills were moved in to harvest the virgin timber of the area. Many of the present communities grew up around these sawmills. After the timber was harvested, the economy shifted mainly to farming. Later, second-growth pine became one of the major resources.

The county is now dominantly agricultural. Corn and soybeans are the main row crops. Forest products are the major source of income from the land. Much of the income of the residents comes from industries that are within commuting distance.

The climate of George County is humid and temperate. Winters are rather mild, and summers are hot. Data on temperature and precipitation are shown in table 1.

Several freezes are common in winter, especially at night, but thawing generally takes place during the day. Sleet and snow are rare. Winter cover crops, such as oats, rye, wheat, clover, winter peas, and such truck crops as collards, onions, turnips, radishes, and lettuce, can be grown in winter.

The average date of the first killing frost in fall is November 22, and that of the last killing frost in spring is March 5. Frost has been recorded, however, as early as October 21 and as late as April 12. The higher uplands often escape the same frosts that are severe in the river bottoms. The frost-free season is approximately 261 days.

Summers are generally long. The warm summer nights are often cooled by breezes coming inland from the Gulf of Mexico. Summer showers provide temporary relief from the hot days, but humid conditions frequently occur afterward.

The average annual rainfall amounts to 62.21 inches. More than half of it occurs in spring and summer. Its distribution is such that damage to crops seldom occurs, although short periods of dry or wet weather can be expected throughout the year.

The county is drained by the Pascagoula and Escatawpa Rivers and their tributaries. The Pascagoula River flows from north to south through the western part of the county, and the Escatawpa River flows from north to south through the southeastern part. The flood plains of these rivers are subject to frequent flooding. They are interlaced with oxbow lakes and sloughs.

Parallel to the flood plains are strips of river terrace as much as 2 1/2 miles wide. These terraces are nearly level to gently sloping, and the soils are sandy to clayey in texture.

The upland areas of the county are nearly level to very steep. Some of the interstream divides are broad flats that are nearly level to gently sloping. Other areas are dissected by drainageways and are generally steeper. Elevations range from about 20 to 300 feet above sea level. The highest point is in the north-central part of the county, and the lowest is near the Jackson County line. Small streams throughout the lower areas have mucky flood plains that are wet most of the year.

Water for domestic use is obtained from wells and springs. Wells range from 11 to 660 feet in depth (3, 4). Aquifers are in the Citronelle and Pascagoula Formations and in Hattiesburg Clay. Artesian wells can be drilled in the Pascagoula Formation and on the river terraces and flood plain. The base of fresh water ranges from 900 feet along the northern boundary to 1,500 feet in the southwestern corner of the county (14). Since the porous Citronelle Formation overlies the clays of the Pascagoula Formation, there are numerous seep areas at the base of steeper slopes. These areas can be developed into useful springs.

In the early years, nearly all commerce was carried on by river transportation. When railroads were built through the county, river shipping rapidly declined. Two railroads now serve George County. One runs generally in a northwest-southeast direction, and the other originates at Evanston and runs in a north-south direction to the Gulf Coast. Neither railroad offers passenger service. Most of the freight shipped out by rail is wood and wood products. Generally, the incoming material consists of slag, lime, fertilizer, and some farm equipment. Commercial truck companies haul most of the local freight.

State Highway 63 runs in a north-south direction; it links Lucedale with Leakesville and the Gulf Coast. U.S. Highway 98 is the most heavily traveled highway. It leads to Mobile, Alabama, and Hattiesburg, Mississippi. State Highway 26 runs from Lucedale to Wiggins. There are many hard-surface farm-to-market roads throughout the county and many well-graded gravel roads.

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA

[All data from records at Leakesville, Greene County, 15 miles north of Lucedale, elevation 105 feet]

Month	Temperature 1/			Precipitation			
	Average	Maximum recorded	Minimum recorded	Average 1/	Driest year (1924) 2/	Wettest year (1900) 2/	Average snowfall 3/
	°F.	°F.	°F.	Inches	Inches	Inches	Inches
December	51.4	84	11	5.95	5.86	8.72	(4/)
January	50.9	84	9	5.10	7.32	5.31	(4/)
February	52.6	86	-5	5.67	5.21	12.12	0.5
Winter	51.6	84	6	5.57	6.13	8.72	.5
March	60.0	91	17	5.97	1.98	5.50	0
April	66.2	95	29	5.04	2.42	8.09	0
May	73.4	100	39	5.20	4.21	5.84	0
Spring	66.5	95	28	5.40	2.82	5.51	0
June	79.6	106	49	5.44	7.14	15.88	0
July	81.3	109	54	7.52	1.72	6.83	0
August	81.4	106	54	5.16	2.62	4.89	0
Summer	80.8	107	52	6.04	3.89	9.10	0
September	78.0	105	37	4.91	2.55	5.92	0
October	67.7	100	24	2.99	.42	3.60	0
November	57.6	89	10	3.26	.09	1.84	0
Fall	67.8	98	27	3.72	1.02	3.79	0
Year	66.7	100	-5	62.21	11.74	82.28	0

1/ Based on records for the period 1897 through 1952.

2/ Based on records for the period 1894 through 1930.

3/ Based on records for the period 1933 through 1952.

4/ Trace.

HOW THIS SOIL SURVEY WAS MADE

Soil scientists made this survey to learn what kinds of soil are in George County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes; the size and speed of streams; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The soil series (10) 1/ and the soil phase are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Benndale and Susquehanna, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Benndale fine sandy loam, 5 to 8 percent slopes, is one of several phases within the Benndale series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

A comparison of the detailed soil map for this county with that of adjoining counties will show a few places where soil boundaries that overlap county lines do not match perfectly. These differences arise because continuing refinement of the soil classification system has resulted in some changes in classification by soil series. In such places soil symbols differ. In addition, some of the soils occur in associations in proportions different from those of adjoining counties.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Two such kinds of mapping units are shown on the soil map of George County: soil complexes and soil associations.

A soil complex consists of areas of two or more soils, so intermingled or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Susquehanna-Benndale complex, 12 to 17 percent slopes, is an example.

A soil association is made up of adjacent soils that occur as areas large enough to be shown individually on the soil map but are shown as one unit because the time and effort of delineating them separately cannot be justified. There is a considerable degree of uniformity in pattern and relative extent of the dominant soils, but the soils may differ greatly one from another. The name of an association consists of the names of the dominant soils, joined by a hyphen. Leaf-Lenoir association is an example.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way as to be readily useful to different groups of users, among them farmers, managers of woodland, and engineers.

On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under current methods of use and management.

1/ Underscored numbers in parentheses refer to Literature Cited, p. 55 .

GENERAL SOIL MAP

The general soil map at the back of this survey shows, in color, the soil associations in George County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The five soil associations in George County are discussed in the following pages.

1. McLaurin-Benndale-Lucedale association

Well-drained, nearly level to strongly sloping soils on uplands

This association is on extensive ridges and the major interstream divides (see pl. I). It covers about 32 percent of the county.

McLaurin soils make up about 30 percent of this association; Benndale soils, about 25 percent; and Lucedale soils, about 12 percent. The rest of the association consists mostly of the somewhat excessively drained Eustis and Alaga soils.

The major soils of this association formed chiefly in loamy material. They are well drained. McLaurin soils have a surface layer of very dark grayish-brown fine sandy loam underlain by yellowish-red sandy loam. Benndale soils have a surface layer of dark grayish-brown fine sandy loam underlain by yellowish-brown to strong-brown loam or sandy loam. Lucedale soils have a surface layer of dark reddish-brown sandy loam underlain by dark-red sandy clay loam or clay loam.

This association is used mainly for row crops and pasture. Some of the acreage is in pine trees and scattered hardwoods. Row crops are well suited; soybeans and corn are the main crops. Most farms in this association are less than 100 acres in size.

2. McLaurin-Susquehanna-Alaga association

Somewhat poorly drained to somewhat excessively drained, nearly level to moderately steep soils on uplands

This association is on uplands dissected by short drainageways. It covers about 30 percent of the county.

McLaurin soils make up about 20 percent of this association; Susquehanna soils, about 20 percent; and Alaga soils, about 20 percent. The rest of the association consists of the well-drained Benndale soils, the somewhat excessively drained Eustis soils, and the excessively drained Lakeland soils.

The major soils of this association formed in sandy, loamy, and clayey material. McLaurin soils are well drained. They have a surface layer of very dark grayish-brown fine sandy loam underlain by yellowish-red sandy loam. Susquehanna soils are somewhat poorly drained. They have a surface layer of dark-gray fine sandy loam underlain by mottled clay. Alaga soils are somewhat excessively drained. They have a surface layer of dark grayish-brown loamy sand underlain by yellowish-brown to very pale brown loamy sand.

This association is used mainly for woodland. A small acreage is used for pasture and cropland. Most of the woodland is in pine trees and scattered hardwoods. A large part of this association is owned by lumber and paper companies.

3. Susquehanna-Benndale association

Somewhat poorly drained and well-drained, nearly level to moderately steep soils on uplands

This association is on uplands. It covers about 9 percent of the county.

Susquehanna soils make up about 40 percent of this association, and Benndale soils make up about 25 percent. The rest of the association consists mostly of McLaurin, Basin, Atmore, and Harleston soils.

The major soils of this association formed chiefly in clayey and loamy material. Susquehanna soils are somewhat poorly drained. They have a surface layer of dark-gray fine sandy loam underlain by mottled clay. Benndale soils are well drained. They have a surface layer of dark grayish-brown fine sandy loam underlain by yellow to strong-brown sandy loam.

This association is used mainly for woodland. A small acreage is used for row crops and pasture. The row crops, mainly corn, are in small fields. Most of this association is commercially owned, State owned, or federally owned. Private holdings average less than 100 acres in size.

4. Harleston-Lenoir-Atmore association

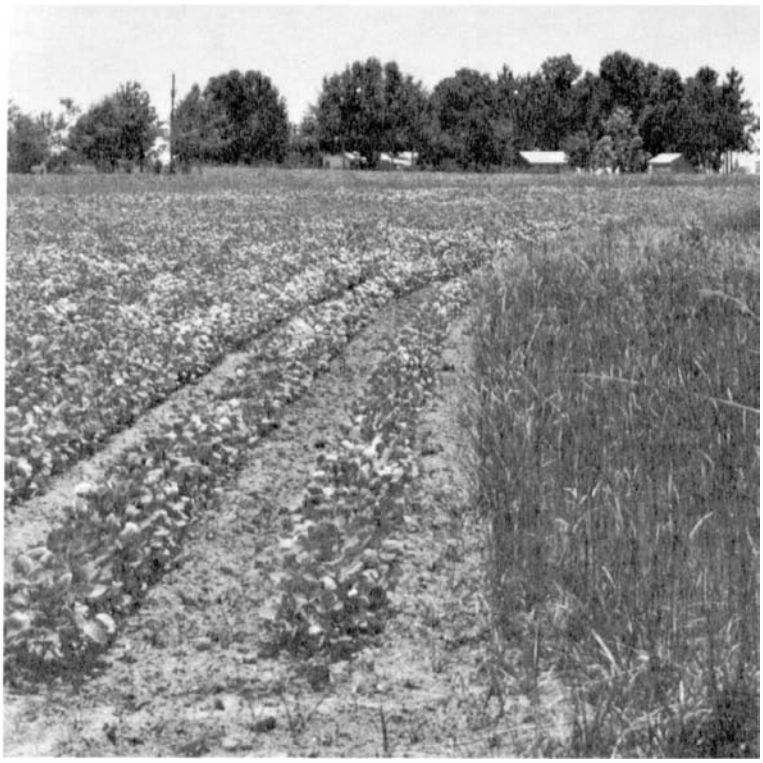
Moderately well drained to poorly drained, nearly level soils adjacent to flood plains

This association is on broad flats adjacent to the river flood plains. It covers about 13 percent of the county.

An area of bahiagrass pasture in association 1. The soil is McLaurin fine sandy loam, a nearly level to gently sloping soil.

Dairy cattle grazing oats. The soil is Lucedale sandy loam, 0 to 2 percent slopes, in capability unit I–1.

Mulch-planted corn. The soil is McLaurin fine sandy loam, 0 to 2 percent slopes, in capability unit IIs–1.



Contour farming. The soil is McLaurin fine sandy loam, 2 to 5 percent slopes, in capability unit IIe–1.

Harleston soils make up about 35 percent of this association; Lenoir soils, about 25 percent; and Atmore soils, about 16 percent. The rest of the association consists of the somewhat poorly drained Basin soils, the moderately well drained Angie soils, the well-drained Cahaba and Rumford soils, the somewhat excessively drained Alaga soils, and the poorly drained Myatt soils.

The major soils of this association formed in loamy and clayey material. Harleston soils are moderately well drained. They have a surface layer of very dark gray fine sandy loam underlain by yellowish-brown or brownish-yellow loam mottled with gray. Lenoir soils are somewhat poorly drained. They have a surface layer of very dark gray silt loam underlain by brownish, mottled loam over gray, mottled clay. Atmore soils are poorly drained. They have a surface layer of dark-gray fine sandy loam underlain by light-gray, mottled sandy loam.

This association is used mainly for pine trees and hardwoods. A small acreage is used for pasture and row crops, but the association has a good potential for these uses.

5. Leaf-Lenoir association

Poorly drained and somewhat poorly drained, nearly level soils on flood plains

This association occurs on the flood plains of the Pascagoula and Escatawpa Rivers, Black Creek, and Red Creek. It covers about 16 percent of the county.

Leaf soils make up about 50 percent of this association, and Lenoir soils make up about 40 percent. The rest of the association consists of soils that are very poorly drained to excessively drained and that range from loamy sand to clay in texture. The well-drained sandy soils are generally on natural levees, and the poorly drained silty and clayey soils are in slack-water areas.

The major soils of this association formed in clayey material. Leaf soils are poorly drained. They have a surface layer of dark grayish-brown silt loam underlain by light brownish-gray or gray silty clay. Lenoir soils are somewhat poorly drained. They have a surface layer of very dark gray silt loam underlain by brownish, mottled loam over gray, mottled clay.

Nearly all of this association is in hardwood forest. A few small areas have stands of pine trees. The areas at the lowest elevations are flooded nearly every year, but the higher ridges of the better drained soils are flooded on an average of 1 year in 5. These soils are suited to woodland, but higher areas have potential for growing cultivated crops and pasture. Most of this association is owned by industries that use wood.

DESCRIPTIONS OF THE SOILS

This section describes the soil series and mapping units of George County. The approximate acreage and proportionate extent of the soils are given in table 2.

In the pages that follow, a general description of each soil series is given. Each series description has a short narrative description of a typical profile and a much more detailed description of the same profile, from which highly technical interpretations can be made. Following the profile is a brief statement of the range in characteristics of the soils in the series, as mapped in George County.

Following the series description, each mapping unit in the series is described individually. For full information on any one mapping unit, it is necessary to read the description of the soil series as well as the description of the mapping unit.

The composition of mapping units mapped as associations is more variable than that of mapping units that consist mainly of a single soil because mapping was done at a lower intensity for the associations. The composition of the mapping units has been controlled well enough, however, to allow interpretations for the expected uses of the soils.

After the name of each mapping unit there is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. At the end of the description of each mapping unit are listed the capability unit, the woodland forage site, and the wildlife group in which the mapping unit has been placed. The pages where these groups are described can be readily learned by referring to the "Guide to Mapping Units." Information about management is given in the soil descriptions.

For more general information about the soils, the reader can refer to the section "General Soil Map," in which the broad patterns of soils are described. Many of the terms used in the soil descriptions and other parts of the survey are defined in the Glossary.

Alaga Series

The Alaga series consists of somewhat excessively drained, strongly acid soils that formed in sandy material. The slope ranges from 0 to 20 percent.

In a representative profile the surface layer is dark grayish-brown loamy sand about 5 inches thick. Below this layer, to a depth of about 50 inches, is yellowish-brown loamy sand.

Representative profile of Alaga loamy sand, 0 to 5 percent slopes, in a large wooded area, 4 1/2 miles south of Lucedale and 1 1/2 miles west of Mississippi Highway 63, NW1/4 NE1/4 sec. 19, T. 2 S., R. 6 W.

A1--0 to 5 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure;

TABLE 2.--APPROXIMATE ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Soil	Acres	Percent	Soil	Acres	Percent
Alaga loamy sand, 0 to 5 percent slopes	5,130	1.7	Harleston fine sandy loam, 2 to 5 percent slopes	8,510	2.8
Alaga loamy sand, 5 to 8 percent slopes	2,055	.7	Lakeland sand, 0 to 5 percent slopes	1,150	.4
Alaga loamy sand, 8 to 12 percent slopes	1,585	.5	Lakeland sand, 5 to 17 percent slopes	2,200	.7
Alaga loamy sand, terrace, 0 to 5 percent slopes	4,670	1.2	Leaf-Lenoir association	46,050	15.2
Alaga complex, 12 to 20 percent slopes	6,195	2.0	Lenoir silt loam	8,575	2.8
Angie silt loam, 0 to 2 percent slopes	1,150	.4	Lucedale sandy loam, 0 to 2 percent slopes	9,150	3.0
Atmore fine sandy loam, 0 to 2 percent slopes	6,795	2.2	Lucedale sandy loam, 2 to 5 percent slopes	2,370	.8
Basin fine sandy loam, 0 to 2 percent slopes	2,955	1.0	McLaurin fine sandy loam, 0 to 2 percent slopes	18,500	6.0
Benndale fine sandy loam, 0 to 2 percent slopes	8,880	2.9	McLaurin fine sandy loam, 2 to 5 percent slopes	23,450	7.6
Benndale fine sandy loam, 2 to 5 percent slopes	6,920	2.2	McLaurin fine sandy loam, 5 to 8 percent slopes	9,380	3.0
Benndale fine sandy loam, 5 to 8 percent slopes	35,900	1.9	McLaurin fine sandy loam, 8 to 12 percent slopes	6,010	1.9
Benndale complex, 2 to 5 percent slopes	1,290	.4	Myatt silt loam, 0 to 2 percent slopes	745	.2
Benndale complex, 5 to 12 percent slopes	6,650	2.1	Rumford sandy loam, 0 to 2 percent slopes	1,365	.4
Cahaba fine sandy loam, 0 to 2 percent slopes	1,350	.4	Susquehanna fine sandy loam, 2 to 5 percent slopes	1,735	.6
Cahaba fine sandy loam, 12 to 17 percent slopes	6,710	2.2	Susquehanna fine sandy loam, 5 to 8 percent slopes	1,250	.4
Dorovan-Johnston association	5,050	11.6	Susquehanna fine sandy loam, 8 to 12 percent slopes	870	.2
Eustis loamy sand, 0 to 5 percent slopes	14,090	4.5	Susquehanna complex, 2 to 5 percent slopes	7,310	2.4
Eustis loamy sand, 5 to 12 percent slopes	6,175	2.0	Susquehanna complex, 5 to 12 percent slopes	1,150	.4
Eustis loamy sand, 12 to 20 percent slopes	7,610	2.5	Susquehanna complex, 12 to 17 percent slopes	5,530	1.8
Harleston fine sandy loam, 0 to 2 percent slopes	5,850	1.9	Susquehanna-Benndale complex, 12 to 17 percent slopes	15,610	5.1
			Total	307,840	100.0

very friable; strongly acid; clear, smooth boundary.

C1--5 to 11 inches, yellowish-brown (10YR 5/4) loamy sand; single grain; very friable; strongly acid; clear, smooth boundary.

C2--11 to 50 inches, yellowish-brown (10YR 5/8) loamy sand; single grain; loose; strongly acid; gradual, smooth boundary.

C3--50 to 74 inches, very pale brown (10YR 7/3) sand; few, fine, distinct mottles of strong brown; single grain; loose; strongly acid; gradual, smooth boundary.

C4--74 to 85 inches, mottled yellow (10YR 7/8), white (10YR 8/2), and reddish-yellow (5YR 6/8) sand; single grain; loose; strongly acid.

The A1 horizon is grayish brown, dark grayish brown, or very dark grayish brown. The C1 and C2 horizons are yellowish brown, strong brown, or brownish yellow. The texture in these horizons is dominantly loamy sand or loamy fine sand. In some places, however, the C1 and C2 horizons contain thin strata of sand or fine sand. The content of silt and clay, at depths between 10 and 40 inches, ranges from 10 to 25 percent. The color of the lower part of the C horizon is very pale brown, brownish yellow, or strong brown mottled with white and shades of brown, red, gray, or yellow. The texture in the lower part of the C horizon ranges from sand to loamy fine sand.

Alaga soils are geographically associated with Eustis, Lakeland, and McLaurin soils. They are not

so red below the surface layer as Eustis soils, and they lack a Bt horizon. They contain more silt and clay in the uppermost 50 inches than Lakeland soils. Alaga soils are coarser textured throughout than McLaurin soils.

Alaga loamy sand, 0 to 5 percent slopes (AgB).--This soil occurs on ridgetops. It has the profile described as representative of the series. Included in mapping were small areas of Eustis loamy sand and McLaurin sandy loam.

This soil is strongly acid. Permeability is rapid, and the available water capacity is low. Runoff is slow, and erosion is not a serious hazard.

Most of the acreage is in woodland; about 25 percent is in cropland and pasture. Deep-rooted plants, such as Coastal bermudagrass and bahiagrass, are well suited. Corn, oats, wheat, and pecan and pine trees are also suited. Corn and small grain, however, are damaged during periods of drought. If the soil is cultivated, a conservation cropping system and such practices as contour cultivation and grassed waterways are needed on the more sloping areas. The soil can be cultivated soon after a rain without risk of crusting or clodding. (Capability unit IIIs-1; woodland group 3s2; woodland forage site 2; wildlife group 2)

Alaga loamy sand, 5 to 8 percent slopes (AgC).--This soil occurs on uplands. It has a surface layer of dark grayish-brown loamy sand about 4 inches thick. This layer is underlain by strong-brown to brownish-yellow loamy sand to a depth of more than 65 inches. Included in mapping were small areas of Eustis and Lakeland soils. Also included were small areas of yellowish-red sandy loam more than 40 inches deep.

This soil is strongly acid. Permeability is rapid, and the available water capacity is low. Runoff is slow to medium, and erosion is a hazard where water concentrates and the ground cover has been removed.

Most of the acreage is used for woodland; a small part is used for cropland and pasture. Coastal bermudagrass, bahiagrass, crimson clover, ball clover, sericea lespedeza, and pine trees are suited. If the soil is used for row crops, contour cultivation and grassed waterways are needed to control erosion. The soil can be cultivated soon after a rain without risk of clodding or crusting. (Capability unit IVs-1; woodland group 3s2; woodland forage site 2; wildlife group 2)

Alaga loamy sand, 8 to 12 percent slopes (AgD).--This soil occurs on uplands. It has a surface layer of dark grayish-brown loamy sand about 6 inches thick. This layer is underlain by brownish-yellow to yellowish-brown loamy sand. Included in mapping were small areas of Eustis soils and of soils that contain a layer of yellowish-red sandy clay loam.

This soil is strongly acid. Permeability is rapid, and the available water capacity is low. Runoff is medium. Erosion is a hazard where water concentrates and the ground cover has been removed.

This soil is too steep for cultivation. Pine trees, Coastal bermudagrass, bahiagrass, crimson clover, ball clover, and sericea lespedeza are suited. (Capability unit VIs-1; woodland group 3s2; woodland forage site 2; wildlife group 2)

Alaga loamy sand, terrace, 0 to 5 percent slopes (AlB).--This soil is adjacent to the river flood plains. The surface layer is dark grayish-brown loamy sand about 5 inches thick. Below this layer, to a depth of about 50 inches, is yellowish-brown to brownish-yellow loamy sand. This is underlain by sand mottled with shades of gray, white, yellow, and brown. In this soil the water table is nearer the surface than in Alaga loamy sand. Included in mapping this soil were small areas of Harleston, Basin, and Lakeland soils. In a few areas the texture of the surface layer is sand.

This soil is strongly acid. Permeability is rapid, but the available water capacity is low. Except during periods of prolonged drought, the water table fluctuates at levels where it can compensate for the low available water capacity. Runoff is slow, and erosion is not a serious hazard. The organic-matter content is low.

Most of this soil is used for woodland; a small part is used for cropland and pasture. Corn, oats, wheat, truck crops, Coastal bermudagrass, bahiagrass, crimson clover, ball clover, sericea lespedeza, and pine trees are well suited. If the soil is cultivated, a good conservation cropping system and grassed waterways are needed on the more strongly sloping areas. (Capability unit IIIs-1; woodland group 2s2; woodland forage site 2; wildlife group 3)

Alaga complex, 12 to 20 percent slopes (AmE).--This complex is on relatively short side slopes. The Alaga soil makes up about 46 percent of the acreage. About 21 percent is made up of soils that have a surface layer of loamy sand and are underlain by yellowish-red sandy loam at a depth of 40 to 60 inches. The rest of the complex consists mostly of McLaurin soils and a soil that has a layer of yellowish-red sandy loam beginning at a depth of 20 to 40 inches. The pattern and extent of the soils vary from one place to another; one or both of the major soils, however, and one or more of the minor soils occur in any given area.

The Alaga soil has a surface layer of dark grayish-brown loamy sand about 4 to 10 inches thick. Below this is yellowish-brown or brownish-yellow loamy sand. This soil is somewhat excessively drained and strongly acid. Permeability is rapid, and the available water capacity is low.

The other soils in the complex have a surface layer of loamy sand of varying thickness underlain by yellowish-red sandy loam. They are well drained and strongly acid. Permeability is rapid through the loamy sand but is moderate in the sandy loam. Runoff is medium.

Nearly all of this complex is in mixed hardwoods and pines. The soils are suitable for pines, but they are too steep for crops and pasture. (Capability

unit VIIs-1; woodland group 3s2; woodland forage site 2; wildlife group 2)

Angie Series

The Angie series consists of moderately well drained, strongly acid soils on river terraces. These soils formed in loamy and clayey material.

In a representative profile the surface layer is dark grayish-brown silt loam about 6 inches thick. The subsurface layer is light yellowish-brown silt loam about 4 inches thick. This is underlain by brownish-yellow to yellow loam or clay loam about 13 inches thick. Below this, to a depth of about 64 inches, is mottled yellow, light-gray, and red clay.

Representative profile of Angie silt loam, 2 miles south of church on Mississippi Highway 26, 1 mile west on Wilkinson Ferry Road, 2 1/4 miles south on a woods road, SW1/4 SE1/4 sec. 5, T. 3 S., R. 7 W.

A1--0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine and medium, granular structure; friable; strongly acid; clear, smooth boundary.

A2--6 to 10 inches, light yellowish-brown (10YR 6/4) silt loam; common, medium, faint mottles of dark grayish brown; weak, fine and medium, granular structure and weak, fine, subangular blocky; friable; strongly acid; clear, smooth boundary.

B1t--10 to 15 inches, brownish-yellow (10YR 6/6) loam; weak, medium, subangular blocky structure; friable; coating and bridging of sand grains with clay; strongly acid; gradual, wavy boundary.

B21t--15 to 23 inches, yellow (10YR 7/6) clay loam; few, fine, distinct mottles of very pale brown and yellowish brown; moderate, medium, subangular blocky structure; friable to firm; continuous clay films on ped faces; strongly acid; gradual, smooth boundary.

B22t--23 to 52 inches, mottled yellow (10YR 7/6), light-gray (10YR 7/1) and red (2.5YR 4/8) clay; moderate, medium, subangular blocky structure; firm; clay films on ped faces; strongly acid; gradual, wavy boundary.

B23t--52 to 64 inches, red (2.5YR 4/8) clay; common, medium, prominent mottles of light gray and few, fine, prominent mottles of yellow; moderate, medium, subangular blocky structure; firm; continuous clay films on ped faces; strongly acid.

The A1 horizon is very dark gray, very dark grayish brown, dark grayish brown, dark gray, dark brown, or brown. It ranges from 2 to 6 inches in thickness. The A2 horizon is dark grayish brown, grayish brown, brown, pale brown, yellowish brown or light yellowish brown. It ranges from 3 to 6 inches in thickness. The upper part of the Bt horizon is yellowish brown, brownish yellow, or yellow. Gray mottles are within 10 to 30 inches of the surface. The texture of the B2t horizon is loam, sandy clay loam, clay loam, or clay. The clay content ranges from 35 to 50 percent.

Angie soils are geographically associated with Cahaba and Lenoir soils. They are finer textured in the Bt horizon than Cahaba soils. They are better drained than the somewhat poorly drained Lenoir soils.

Angie silt loam, 0 to 2 percent slopes (AnA).--This soil is adjacent to flood plains. Included in mapping were small areas of Cahaba and Lenoir soils. Also included were areas where the soils are redder than Angie soils and areas where the slope is more than 2 percent.

This soil is strongly acid. Permeability is slow, and the available water capacity is moderate to high. Runoff is slow, and erosion is not a serious hazard. During rainy spells runoff is moderately slow.

Approximately 95 percent of the acreage is used for woodland; the rest is in cropland or pasture. A few selected truck crops, corn, oats, soybeans, Coastal bermudagrass, tall fescue, bahiagrass, white clover, and pine trees are suited. During rainy spells runoff is the chief hazard if this soil is cultivated. Proper row arrangement, open ditches, and diversions will remove the surface water. (Capability unit IIw-2; woodland group 2w8; woodland forage site 1; wildlife group 3)

Atmore Series

The Atmore series consists of poorly drained, very strongly acid, loamy soils. These soils have compact and brittle layers. Concretions and red mottles make up more than 5 percent of these layers. These soils formed in loamy material and are nearly level.

In a representative profile the surface layer is dark-gray fine sandy loam about 2 inches thick. The subsurface layer is light-gray fine sandy loam about 12 inches thick. The next layer, to a depth of about 28 inches, is light-gray fine sandy loam mottled with yellow and brown. Below this, to a depth of about 60 inches, is a brittle, compact layer of light-gray and light yellowish-brown sandy loam mottled with red and brown. Concretions and red mottles make up about 10 percent of the upper part of this layer.

Representative profile of Atmore fine sandy loam, 0 to 2 percent slopes, 300 feet southwest of Mississippi Highway 57, 0.9 mile north of county barn and 1 1/2 miles south of Benndale, SW1/4 SW1/4 sec. 34, T. 2 S., R. 8 W.

A1--0 to 2 inches, dark-gray (10YR 4/1) fine sandy loam; weak, medium, granular structure; friable; many fine roots; very strongly acid; abrupt, smooth boundary.

A21g--2 to 14 inches, light-gray (10YR 6/1) fine sandy loam; many, fine, distinct, yellowish-brown root stains; weak, medium, subangular

blocky structure; friable; few fine pebbles, less than 2 percent by volume; very strongly acid; gradual, wavy boundary.

A&B--14 to 28 inches, light-gray (10YR 6/1) fine sandy loam; many, medium, distinct mottles of brownish yellow (10YR 6/8); weak, medium, subangular blocky structure; friable; very strongly acid; gradual, smooth boundary.

B'x1&A'21--28 to 44 inches, light-gray (10YR 6/1) sandy loam; many, coarse, distinct mottles of red (2.5YR 4/8) and very pale brown (10YR 7/4); common, medium, distinct mottles of yellowish brown (10YR 5/6); moderate, medium, subangular blocky structure; firm; 10 to 15 percent firm red nodules of plinthite; few concretions that have black centers and are strong brown outside; patchy clay films; very strongly acid; gradual, wavy boundary.

B'x2&A'22--44 to 60 inches, light yellowish-brown (10YR 6/4) sandy loam; many, coarse, distinct mottles of light gray (10YR 6/1) and yellowish brown (10YR 5/8); weak, coarse, subangular blocky structure; firm; compact; few voids; patchy clay films on yellowish-brown part; few pockets of sand; very strongly acid.

The A1 horizon is black, very dark gray, very dark brown, or dark gray. It ranges from 2 to 4 inches in thickness. The A2 horizon is dark grayish brown, grayish brown, or light gray. It ranges from 9 to 15 inches in thickness. The A&B horizon is light gray or gray and has shades of red, pale brown, yellowish brown, or brownish yellow. The B'x1&A'21 horizon is light gray to light brownish gray mottled with yellow, gray, and brown. The texture of this horizon is sandy loam, fine sandy loam, or loam. A small amount of fine and medium gravel and a few concretions occur in some profiles. The upper part of this horizon is 5 to 40 percent red plinthite.

Atmore soils are geographically associated with Basin, Harleston, Lenoir, and Susquehanna soils. They differ from the associated soils in being poorly drained and having a fragipan that is more than 5 percent plinthite.

Atmore fine sandy loam, 0 to 2 percent slopes (AtA).--This is a poorly drained soil. Included in the mapping of this soil were small areas of Basin and Lenoir soils. Also included were a few small areas that have a very dark gray surface layer more than 10 inches thick.

This soil is very strongly acid. The available water capacity is moderate. Permeability is moderate in the upper part of the profile and moderately slow in the fragipan. Runoff is slow. The soil is saturated during rainy seasons.

Most drained areas are in woodland, but a small acreage is used for pasture. Bahiagrass, bermudagrass, tall fescue, ryegrass, and white clover are suited. Loblolly pine, slash pine, and selected hardwoods are also suited. (Capability unit IVw-1; woodland group 3w9; woodland forage site 3; wildlife group 3)

Basin Series

The Basin series consists of somewhat poorly drained, nearly level, strongly acid soils. These soils formed in loamy material.

In a representative profile the surface layer is very dark gray fine sandy loam about 4 inches thick. The subsurface layer is grayish-brown fine sandy loam about 5 inches thick. This layer is underlain by pale-brown to light yellowish-brown loam that has gray mottles and a few strong-brown nodules to a depth of about 25 inches. Below this, to a depth of about 60 inches, is a layer of compact and brittle, firm, brownish-yellow loam mottled with light gray.

Representative profile of Basin fine sandy loam, 0 to 2 percent slopes, in a wooded area, 2.75 miles south of school, 0.75 mile south of church, and 150 feet south of blacktop road, NE1/4 SE1/4 sec. 39, T. 3 S., R. 7 W.

A1--0 to 4 inches, very dark gray (10YR 3/1) fine sandy loam; weak, medium, granular structure; friable; strongly acid; clear, smooth boundary.

A2--4 to 9 inches, grayish-brown (10YR 5/2) fine sandy loam; weak, medium, granular structure; friable; many, fine, dark grayish-brown worm casts; strongly acid; clear, smooth boundary.

B21--9 to 16 inches, pale-brown (10YR 6/3) light loam; weak, medium, subangular blocky structure; few, fine, faint, light grayish-brown mottles; friable; sand grains stripped of clay; strongly acid; clear, wavy boundary.

B22--16 to 25 inches, light yellowish-brown (10YR 6/4) loam; common, medium, distinct, strong-brown mottles and common, fine, faint, gray mottles; weak, medium, subangular blocky structure; friable; 10 to 25 percent yellowish-red to red nodules of soft plinthite; strongly acid; clear, wavy boundary.

A'2&B'x1--25 to 31 inches, light-gray (10YR 7/1) loam; many, coarse, distinct, brownish-yellow (10YR 6/6) mottles; weak, fine and medium, angular blocky structure; firm; brownish-yellow B'x material surrounded by coarser, light-gray material; 10 to 25 percent nodules of soft plinthite; strongly acid; gradual, wavy boundary.

B'x2&A'2--31 to 39 inches, brownish-yellow (10YR 6/6) loam; common, coarse, distinct mottles of light gray (10YR 7/1); weak, fine and medium, angular blocky structure; firm; polygonal cracking; coarser textured, light-gray material in cracks; strongly acid; gradual, wavy boundary.

B'x3--39 to 60 inches, mottled yellow (10YR 7/6) and light-gray to gray (10YR 6/1) loam; weak, medium, subangular blocky structure; friable; strongly acid.

The A1 horizon is black, very dark gray, or very dark grayish brown. The B horizon is pale brown, light yellowish brown, yellowish brown, or brownish yellow. The texture of the B horizon is sandy loam, loam, or silt loam. The B'x horizon is light

yellowish brown, brownish yellow, or yellowish brown mottled with gray, brown, red, and yellow. Red, yellowish-red, and strong-brown nodules of plinthite make up 10 to 50 percent of this horizon. The depth to the B'x horizon ranges from 18 to 40 inches. The texture of the B'x horizon is sandy loam, loam, or silt loam.

Basin soils are geographically associated with Atmore and Harleston soils. They are better drained than Atmore soils. They are more poorly drained than Harleston soils, which lack the fragipan and contain less plinthite than Basin soils.

Basin fine sandy loam, 0 to 2 percent slopes (BaA).--This is a somewhat poorly drained soil. Included in the mapping of this soil were a few small areas of Atmore and Harleston soils.

This soil is strongly acid and contains a small amount of organic matter. Permeability is moderate in the upper part of the profile, but it is slow in the lower part. The available water capacity is moderate. Runoff is slow or very slow. The water table is near the surface during periods of heavy rainfall.

Approximately 80 percent of the acreage is in woodland; a small acreage is in pasture. Only a limited number of crops are suited. These include corn, oats, soybeans, sorghum, selected truck crops, Coastal bermudagrass, bahiagrass, tall fescue, white clover, and pine trees. Drainage is needed for crop production. (Capability unit IIIw-1; woodland group 2w8; woodland forage site 3; wildlife group 3)

Benndale Series

The Benndale series consists of well-drained, very strongly acid soils that formed in loamy material. The slope ranges from 0 to 12 percent.

In a representative profile the surface layer is dark grayish-brown fine sandy loam about 5 inches thick. This is underlain by yellowish-brown loam about 20 inches thick. Below this, to a depth of about 48 inches, is mainly yellowish-brown sandy loam mottled with brown and red. Below this layer, to a depth of about 68 inches, is brownish-yellow sandy loam mottled with brown and red. The underlying material is sandy loam mottled with red, brown, and gray.

Representative profile of Benndale fine sandy loam, 0 to 2 percent slopes, in a wooded area, 4.6 miles north of church on Merrill Road, 100 feet east and 10 feet west of gate on south side of woods road, on section line between secs. 29 and 40, T. 1 S., R. 7 W.

A1--0 to 2 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; friable; many grass roots; strongly acid; abrupt, smooth boundary.

A&B--2 to 5 inches, mottled dark grayish-brown (10YR 4/2) and yellowish-brown (10YR 5/4) fine sandy loam; moderate, fine, granular structure and weak, medium, subangular blocky; friable; many fine grass roots; very strongly acid; clear, smooth boundary.

B1--5 to 11 inches, yellowish-brown (10YR 5/6) loam; many, fine, distinct mottles of dark grayish brown; weak, medium, subangular blocky structure; friable; few fine and medium roots; very strongly acid; clear, smooth boundary.

B21t--11 to 25 inches, yellowish-brown (10YR 5/6) loam; weak to moderate, subangular blocky structure; friable; few fine roots; sand grains bridged and coated with clay; very strongly acid; gradual, wavy boundary.

B22t--25 to 33 inches, brownish-yellow (10YR 6/6) loam; few, medium, distinct mottles of strong brown; weak to moderate, medium, subangular blocky structure; friable; few, medium, distinct splotches of clean sand grains between peds; few voids and vesicules; sand grains coated and bridged with clay; few, thin, patchy clay films; very strongly acid; gradual, wavy boundary.

B23t--33 to 48 inches, yellowish-brown (10YR 5/6) sandy loam; many, fine, distinct mottles of strong brown; common, medium, prominent mottles of yellowish red and common, medium, distinct mottles of light yellowish brown; weak to moderate, medium, subangular blocky structure; friable to firm; few clean sand grains between peds; sand grains bridged and coated with clay; few voids and vesicles; less than 5 percent soft red plinthite; very strongly acid; gradual, irregular boundary.

B24t--48 to 68 inches, brownish-yellow (10YR 6/6) sandy loam; many, medium, distinct mottles of gray; many, coarse, distinct mottles of yellowish red; few, fine, prominent mottles of red; weak, coarse, angular blocky structure; friable; gray splotches where there is some stripping of clay from sand grains; sand grains bridged and coated with clay; less than 5 percent soft red plinthite; very strongly acid; gradual, wavy boundary.

B25t--68 to 73 inches, mottled red, (10YR 4/8), yellowish-brown (10YR 5/6), and gray (10YR 6/1) sandy loam; weak, coarse, angular blocky structure; friable; few, patchy clay films on ped surfaces; very strongly acid.

The A1 horizon ranges from dark gray, dark grayish brown, or gray to yellowish brown in color, and from 1 to 6 inches in thickness. The texture of the A horizon ranges from fine sandy loam to loamy fine sand. The B1 horizon is yellow, brownish yellow, or yellowish brown. It ranges from 2 to 10 inches in thickness. The texture is sandy loam or loam. The B21t and B22t horizons are brownish yellow, yellowish brown, or strong brown. Clay makes up 10 to 18 percent of the uppermost 20 inches of the Bt horizon. The B23t, B24t, and B25t horizons are similar to the B22t horizon, but they have few to many mottles of red, brown, yellow, and gray. The texture of these horizons is loam, sandy loam, light sandy clay loam, or clay loam.

Benndale soils are geographically associated with McLaurin, Harleston, and Susquehanna soils. They have a yellowish-brown or brownish-yellow B horizon; McLaurin soils have a yellowish-red B horizon. They are better drained than Harleston soils. They are better drained than Susquehanna soils and have a coarser textured B horizon.

Benndale fine sandy loam, 0 to 2 percent slopes (BeA).--This soil occurs on uplands. It has the profile described as representative of the series. Included in mapping were small areas of McLaurin and Harleston soils. Also included were areas where soft red nodules of plinthite make up more than 5 percent of the soil.

This soil is very strongly acid. Permeability is moderate, and the available water capacity is moderate. Runoff is slow, and erosion is not a serious hazard. This soil can be cultivated throughout a wide range of moisture content without risk of clodding or crusting.

Most of this soil is in woodland. A small acreage is in cultivation or pasture. Corn, soybeans, oats, millet, wheat, sorghum, truck crops, crimson clover, white clover, ball clover, arrowleaf, ryegrass, sudangrass, bahiagrass, Coastal bermudagrass, and pecan, tung, and pine trees are suited. Row crops can be grown year after year on this soil under good management practices. Droughtiness is a slight hazard. (Capability unit IIs-1; woodland group 2o1; woodland forage site 1; wildlife group 1)

Benndale fine sandy loam, 2 to 5 percent slopes (BeB).--This is a well-drained soil on ridgetops. The surface layer is gray fine sandy loam about 5 inches thick. It is underlain by yellowish-brown to brownish-yellow sandy loam or loam. Included in mapping were a few small areas of McLaurin and Harleston soils. Some areas have soft red nodules of plinthite several inches beneath the surface.

This soil is very strongly acid. Permeability is moderate, and the available water capacity is moderate. Runoff is slow to medium. This soil can be cultivated throughout a wide range of moisture content without risk of crusting or clodding.

Most of this soil is in woodland, but a small acreage is used for cultivated crops or pasture. Corn, millet, oats, wheat, sorghum, soybeans, truck crops, legumes, ryegrass, sudangrass, bahiagrass, Coastal bermudagrass, and pecan, tung, and pine trees are suited.

Erosion is a hazard on cropland, but it can be controlled by the use of conservation cropping systems and supporting mechanical practices. Grassed waterways, stripcropping, or parallel terraces should be used where needed. (Capability unit IIe-1; woodland group 2o1; woodland forage site 1; wildlife group 1)

Benndale fine sandy loam, 5 to 8 percent slopes (BeC).--This is a well-drained soil on uplands. It is mostly on side slopes. The surface layer is gray fine sandy loam about 4 inches thick. It is underlain by yellowish-brown to brownish-yellow sandy loam or loam. Included in mapping were a few small areas of McLaurin and Harleston soils. A few areas have soft red nodules of plinthite.

This soil is very strongly acid. Permeability is moderate, and the available water capacity is moderate. Runoff is medium. If ground cover is removed, erosion becomes a hazard. This soil can be cultivated throughout a wide range of moisture content without risk of crusting or clodding.

Most of this soil is in woodland, but a small acreage is in cultivation or pasture. Pecan, pine, and tung trees, and truck crops, corn, small grain, soybeans, bahiagrass, Coastal bermudagrass, and crimson clover are suited.

Erosion is a hazard if these soils are cultivated. It can be controlled by the use of an adequate conservation cropping system, such as 1 year of row crops and 2 years of small grains or close-growing crops. Supporting mechanical practices, such as stripcropping, parallel terraces, and grassed waterways, also should be used. All farming operations should be on the contour.

Crop residue should be left on the surface after harvest or incorporated into the top 2 or 3 inches of the soil. (Capability unit IIIe-1; woodland group 2o1; woodland forage site 1; wildlife group 1)

Benndale complex, 2 to 5 percent slopes (BnB).--This complex occurs mainly on ridgetops. It is made up mostly of Benndale soils but includes minor components of various other soils. Benndale soils have a surface layer of dark grayish-brown fine sandy loam, about 4 inches thick, underlain by yellowish-brown loam to a depth of more than 35 inches. Below this is yellow clay loam mottled with shades of brown. The minor components of the complex are soils that have varying thicknesses of yellowish-brown loam overlying mottled clay. Included in mapping were areas of Susquehanna, Lakeland, and McLaurin soils.

Benndale soils are well drained and very strongly acid. Permeability is moderate, and the available water capacity is moderate. Runoff is slow to medium.

Most of this complex is in woodland, but a small acreage is in cropland and pasture. Pecan, pine, and tung trees and corn, millet, wheat, oats, sorghum, soybeans, truck crops, legumes, sudangrass, bahiagrass, and Coastal bermudagrass are suited.

Erosion is a hazard if these soils are cultivated, but it can be controlled by the use of a conservation cropping system and supporting mechanical practices. Grassed waterways, stripcropping, or parallel terraces should be used where needed. (Capability unit IIe-1; woodland group 2o1; woodland forage site 1; wildlife group 1)

Benndale complex, 5 to 12 percent slopes (BnC).--This complex is on side slopes. It is made up mostly of Benndale soils but includes minor components of other soils. Benndale soils have a surface layer of dark grayish-brown fine sandy loam, about 4 inches thick, underlain by yellowish-brown sandy

loam to a depth of more than 42 inches. Below this is yellow clay loam mottled with shades of brown.

The minor components of the complex are soils that have a dark grayish-brown surface layer, about 4 inches thick, underlain by varying thicknesses of yellowish-brown loam. Below this is mottled red, gray and brown clay. Included in mapping were areas of McLaurin soils.

Benndale soils are very strongly acid. Permeability is moderate, and the available water capacity is moderate. Runoff is medium to rapid.

Most of this complex is in pine and hardwood forest. Some of the complex is too steep for cropland but is suited to orchards and pasture. Pecan trees, tung trees, bahiagrass, Coastal bermudagrass, and crimson clover are suited.

Erosion is a hazard if these soils are cultivated, but it can be controlled by the use of a conservation cropping system, such as 1 year of row crops and 2 years of small grain or close-growing crops. Supporting mechanical practices, such as stripcropping, parallel terraces, and grassed waterways, also should be used. All farming operations should be on the contour. Crop residue should be left on the surface after harvest or incorporated into the top 2 or 3 inches of the soil. (Capability unit IIIe-1; woodland group 2o1; woodland forage site 1; wildlife group 1)

Cahaba Series

The Cahaba series consists of well-drained, strongly acid soils that formed in loamy material. The slope ranges from 0 to 17 percent.

The surface layer is dark-gray fine sandy loam about 4 inches thick. The subsurface layer is brown sandy loam about 3 inches thick. This is underlain by about 41 inches of yellowish-red or red material that is mostly loam. Below this, to a depth of about 56 inches, is loose loamy sand mottled with red, brown, and yellow.

Representative profile of Cahaba fine sandy loam, 0 to 2 percent slopes, 1.4 miles west of church on Mississippi Highway 26, 1.25 miles south of Mississippi Highway 26, 0.75 mile south of Hess Pumping Station, 200 feet west of road and 20 feet south of log road, NE1/4 SW1/4 sec. 25, T. 2 S., R. 8 W.

A1--0 to 4 inches, dark-gray (10YR 4/1) fine sandy loam; weak, fine, granular structure; friable; many fine roots; strongly acid; clear, smooth boundary.

A2--4 to 7 inches, brown (10YR 4/3) sandy loam; weak, fine, granular and subangular blocky structure; friable; few fine roots; strongly acid; gradual, smooth boundary.

B21t--7 to 14 inches, yellowish-red (5YR 4/8) heavy loam; weak, medium, subangular blocky structure; friable; sand grains coated and bridged with clay; few, patchy clay films on ped surfaces; strongly acid; clear, smooth boundary.

B22t--14 to 27 inches, red (2.5YR 4/6) heavy loam; moderate, medium, subangular blocky structure; friable; sand grains coated and bridged with clay; continuous clay films on ped surfaces; strongly acid; clear, smooth boundary.

B23t--27 to 38 inches, red (2.5YR 4/8) loam; weak, medium, subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid; clear, smooth boundary.

B3t--38 to 48 inches, yellowish-red (5YR 5/8) sandy loam; weak, medium, subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid; clear, smooth boundary.

C--48 to 56 inches +, mottled yellowish-red (5YR 5/6), reddish-yellow (7.5YR 6/8), and very pale brown (10YR 7/4) loamy sand; structureless; loose; strongly acid.

The A1 horizon ranges from dark gray to brown. The A2 horizon is dark brown or brown. The Bt horizon is yellowish red, red, or reddish brown. The texture of this horizon is loam, sandy clay loam, clay loam, or sandy loam. Clay makes up 18 to 30 percent of the upper 20 inches of the Bt horizon. This horizon ranges from 20 to 48 inches in thickness.

Cahaba soils are geographically associated with Angie, Alaga, and McLaurin soils. They are better drained and contain less clay in the B horizon than Angie soils. They are finer textured in the uppermost 20 inches of the Bt horizon than McLaurin soils. They have a Bt horizon, which Alaga soils lack. Unlike Cahaba soils, Alaga soils are sandy.

Cahaba fine sandy loam, 0 to 2 percent slopes (CaA).--This soil occurs as broad, nearly level areas adjacent to the major river flood plains. It has the profile described as representative of the series. Included in mapping were small areas of Angie, Rumford, and Alaga soils and a few areas that have a strong-brown layer underlying the surface layer. Also included were areas where the material below the surface is clay loam.

This soil is strongly acid. The available water capacity is moderate. Permeability is moderate, and runoff is slow. The soil can be cultivated from year to year without serious loss from erosion. Some areas are subject to occasional flooding.

Most of this soil is used for woodland. A small acreage is used for crops or pasture. Corn, oats, millet, wheat, sorghum, soybeans, truck crops, crimson clover, white clover, ryegrass, sudangrass, bahiagrass, Coastal bermudagrass, and pecan and pine trees are suited. (Capability unit I-1; woodland group 2o7; woodland forage site 1; wildlife group 3)

Cahaba fine sandy loam, 12 to 17 percent slopes (CaE).--This soil is on side slopes. The surface layer is dark-gray, friable fine sandy loam underlain by reddish-brown to red sandy clay loam in the upper 30 inches and red sandy loam in the lower part. Included in mapping were areas of McLaurin and Alaga soils and soils that have a surface layer of loamy sand more than 20 inches thick, underlain

by loam. In a few small areas, the surface layer has been thinned by erosion and spots of red sandy clay loam are exposed.

This soil is strongly acid. The available water capacity is moderate. Permeability is moderate. Runoff is rapid, and erosion is a serious hazard if ground cover is removed.

Nearly all of this soil is in woodland, but a small acreage is in pasture. The soil is too steep for cultivated crops. Pine trees, bahiagrass, ball clover, crimson clover, sericea lespedeza, and Coastal bermudagrass are suited. When the soil is used for pasture, grazing should be rotated in order to avoid overuse of the pasture. (Capability unit VIe-1; woodland group 2o1; woodland forage site 1; wildlife group 1)

Dorovan Series

The Dorovan series consists of very poorly drained, very strongly acid, organic soils. The water table is at or near the surface except in areas that have been artificially drained, or in periods when prolonged drought has allowed the soil to dry out. These soils formed on stream flood plains in decayed vegetation under saturated conditions. They have organic layers that are more than 60 inches thick.

In a representative profile the surface layer is very dark brown, partly decomposed material about 3 inches thick. Below this layer, to a depth of about 74 inches, is black muck. The underlying material is very dark grayish-brown sand that grades to dark grayish brown to brown with depth.

Representative profile of Dorovan muck, 2 1/2 miles south of junction of Mississippi Highways 26 and 63, 0.75 mile east of Mississippi Highway 63, 150 feet west of old bridge site, and 75 feet north of road fill in Cedar Creek flood plain, SW1/4 NE1/4 sec. 16, T. 2 S., R. 6 W.

Oe1--0 to 3 inches, very dark brown (10YR 2/2) peaty muck; weak, medium to coarse, granular structure; slightly sticky; many fine to coarse roots; many partly decomposed leaves, roots, and twigs; very strongly acid; clear, smooth boundary.

Oa1--3 to 11 inches, black (10YR 2/1) muck; massive; slightly sticky; common medium to coarse roots; few partly decomposed leaves, twigs, and roots; very strongly acid; gradual, wavy boundary.

Oa2--11 to 74 inches, black (10YR 2/1) muck; massive; semifluid; nonsticky; few coarse roots; few partly decomposed particles of vegetation; very strongly acid; clear, smooth boundary.

IIAb--74 to 92 inches, very dark grayish-brown (10YR 3/2) sand; single grain; nonsticky; few partly decayed bits of woody material; very strongly acid; gradual, wavy boundary.

IIC--92 to 108 inches, dark grayish-brown to brown (10YR 4/2-4/3) sand; single grain; nonsticky; few partly decayed bits of woody material; very strongly acid.

The Oe1 horizon ranges from very dark brown to black. Fiber makes up 50 to 90 percent of this horizon after rubbing. The Oa1 and Oa2 horizons range from black to very dark gray. Fiber makes up less than 10 percent of the Oa1 and Oa2 horizons after rubbing. The Oa2 horizon contains few to common large woody fragments. The buried mineral horizons are loamy or sandy in texture. The soil is saturated with water except in extremely dry seasons.

Dorovan soils are geographically associated with Johnston soils. They differ from Johnston soils in having 60 inches or more of muck.

Dorovan-Johnston association (Dh).--This association consists of soils on flood plains of smaller streams. The areas range from about 100 feet to a quarter of a mile in width and generally cover the entire length of the flood plain. The soils are very poorly drained and contain a large amount of organic matter.

The Dorovan soil makes up about 60 percent of the association, and the Johnston soil about 18 percent. Included in mapping were small areas of poorly drained loamy sand.

The Dorovan soil in this association is very strongly acid and very poorly drained. The water table is at or near the surface most of the year. The available water capacity is very high, and the organic-matter content is high.

The Johnston soil is strongly acid and very poorly drained. It occurs along the edges of the flood plains and in areas where a definite channel has developed. The water table is at or near the surface most of the year. The available water capacity is very high.

Nearly all of this association is under a cover of bottom-land hardwoods consisting of sweetbay, swampbay, water tupelo, and tupelo-gum. The soils are too wet for crops or pasture. Preferred species are loblolly pine, green ash, baldcypress, southern magnolia, red maple, sweetgum, water tupelo, and yellow-poplar. (Capability unit VIIw-1; woodland group 1w9; woodland forage site 3; wildlife group 3)

Eustis Series

The Eustis series consists of somewhat excessively drained, strongly acid soils on uplands. These soils formed in sandy material. The slope ranges from 0 to 20 percent.

In a representative profile the surface layer is dark grayish-brown loamy sand 6 to 8 inches thick. This layer, to a depth of about 92 inches, is underlain by strong-brown to yellowish-red loamy sand. The underlying material is brownish-yellow sand.

Representative profile of Eustis loamy sand, 0 to 5 percent slopes, under a cover of pine trees, 0.2 mile south, 1.1 miles east, and 0.25 mile south of school, SE1/4 NW1/4 sec. 20, T. 1 S., R. 5 W.

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Ap--0 to 6 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, medium structure; loose; many fine roots; strongly acid; clear, smooth boundary.

A&B--6 to 8 inches, dark grayish-brown (10YR 4/2) loamy sand; few, fine and medium, distinct mottles of yellowish brown; weak, medium, granular structure and weak, coarse, subangular blocky; friable; few fine and medium roots; strongly acid; gradual, wavy boundary.

B1t--8 to 15 inches, strong-brown (7.5YR 5/6) loamy sand; weak, medium, granular structure and weak, coarse, subangular blocky; friable; sand grains coated and bridged with clay; strongly acid; gradual, wavy boundary.

B21t--15 to 34 inches, yellowish-red (5YR 5/6) loamy sand; weak, coarse, subangular blocky structure; friable; few areas of stripped sand grains; sand grains coated and bridged with clay; strongly acid; gradual, wavy boundary.

B22t--34 to 92 inches, yellowish-red (5YR 5/8) loamy sand; weak, coarse, subangular blocky structure; friable; few areas of stripped sand grains; sand grains coated and bridged with clay; strongly acid; diffuse, irregular boundary.

C--92 to 100 inches +, brownish-yellow (10YR 6/8) sand; structureless; loose; strongly acid.

The A horizon is dark grayish brown, dark yellowish brown, brown, or yellowish brown. It ranges from 4 to 12 inches in thickness. The Bt horizon is reddish yellow, strong brown, or yellowish red. It ranges from loamy sand to loamy fine sand in texture. Clay and silt make up 10 to 25 percent of the uppermost 20 inches of the B horizon. The Bt horizon is more than 60 inches thick.

Eustis soils are geographically associated with Alaga, Lucedale, and McLaurin soils. They are redder below the surface layer than Alaga soils and have a Bt horizon. They are coarser textured and less reddish than Lucedale soils. They contain less clay in the uppermost 20 inches of the Bt horizon than McLaurin soils.

Eustis loamy sand, 0 to 5 percent slopes (EsB).--This soil is on broad ridgetops. It has the profile described as representative of the series. Included in mapping were small areas of McLaurin and Alaga soils.

This soil is strongly acid. The available water capacity is low. Permeability is rapid. Runoff is slow, and erosion is not a serious hazard. This soil can be cultivated soon after a rain without risk of crusting or clodding. Shallow-rooted plants are damaged by lack of moisture during periods of drought.

Most of the acreage is in cultivation or is used for pasture. A smaller part is in woodland. Corn, oats, millet, sorghum, wheat, truck crops, bahiagrass, Coastal bermudagrass, crimson clover, ball clover, and pecan, tung, and pine trees are suitable crops.

Crop residue should be returned to the soil. Conservation cropping systems and such mechanical practices as contour cultivation and grassed waterways are needed on the more sloping areas. (Capability unit IIIs-1; woodland group 3s2; woodland forage site 2; wildlife group 1)

Eustis loamy sand, 5 to 12 percent slopes (EsD).--This soil is on uplands. The surface layer, about 9 inches thick, is dark grayish-brown to yellowish-brown loamy sand. This layer is underlain by strong-brown to yellowish-red loamy sand. Some areas are underlain by sand at a depth of less than 50 inches. Erosion has removed the surface layer and caused some rill gullying in a few places. Included in mapping were small areas of McLaurin and Alaga soils.

This soil is strongly acid. The available water capacity is low. Permeability is rapid, and runoff is slow to medium. If the ground cover is removed, erosion is a hazard.

The soils of this unit are generally not suited to cultivation. Most of this soil is used for woodland; a small acreage is in cultivation or pasture. Selected truck crops, small grain, bahiagrass, Coastal bermudagrass, crimson clover, ball clover, sericea lespedeza, and pine trees are suited. If the soil is used for row crops, good conservation practices are needed to control erosion. An example of a suitable cropping system is watermelons grown 1 year out of 5 and sod crops for 4 years. (Capability unit VIs-1; woodland group 3s2; woodland forage site 2; wildlife group 1)

Eustis loamy sand, 12 to 20 percent slopes (EsE).--This soil occurs on side slopes. The surface layer is dark grayish-brown to dark yellowish-brown loamy sand about 5 inches thick. This layer is underlain by reddish-yellow to yellowish-red loamy sand more than 60 inches thick. In a few areas erosion has removed the surface layer, and deep, narrow gullies have formed where water from road and field ditches, terraces, or other sources is concentrated. Included in mapping were small areas of Alaga and McLaurin soils. Also included were a few small areas where the surface layer is more than 20 inches thick.

This soil is strongly acid. The available water capacity is low. Permeability is rapid, and runoff is medium. If ground cover is removed or runoff is concentrated, erosion is a hazard. Nearly all of this soil is in woodland. Pine trees are suited. (Capability unit VIIs-1; woodland group 3s2; woodland forage site 2; wildlife group 2)

Harleston Series

The Harleston series consists of moderately well drained, very strongly acid soils that formed in loamy material. The slope ranges from 0 to 5 percent. In a representative profile the surface layer

is very dark gray fine sandy loam about 4 inches thick. The subsurface layer, about 5 inches thick, is brown fine sandy loam underlain by brownish-yellow loam to a depth of 25 inches. Below this, to a depth of about 74 inches, is light yellowish-brown to olive-yellow loam mottled with red, yellow, brown, and gray.

Representative profile of Harleston fine sandy loam, 0 to 2 percent slopes, in a wooded area 2 1/2 miles in a northwesterly direction on gravel road from the intersection of the gravel road and Mississippi Highway 63, 1 1/4 miles north of Jackson County line, 200 feet southeast of woods road, and 50 feet north of gravel road, NW1/4 SW1/4 sec. 30, T. 3 S., R. 6 W.

A1--0 to 4 inches, very dark gray (10YR 3/1) fine sandy loam; moderate, medium, granular structure; friable; many fine and medium roots; very strongly acid; clear, smooth boundary.

A2--4 to 9 inches, brown (10YR 5/3) fine sandy loam; many, fine, distinct mottles of light yellowish brown; moderate, fine to medium, granular structure; friable; numerous grass and tree roots up to 2 inches in diameter; many worm casts and mixtures of soil material with material from the A1 horizon; very strongly acid; clear, wavy boundary.

B21t--9 to 25 inches, brownish-yellow (10YR 6/6) loam; few, fine, distinct mottles of strong brown; weak, fine and medium, subangular blocky structure; friable; few fine roots; sand grains bridged and coated with clay; very strongly acid; clear, wavy boundary.

B22t--25 to 32 inches, light yellowish-brown (2.5Y 6/4) loam; few, medium, distinct mottles of light gray (10YR 7/1) and common, medium, distinct mottles of strong brown (7.5YR 5/6); moderate, medium, subangular blocky structure; friable; sand grains coated and bridged with clay; less than 5 percent soft plinthite; very strongly acid; gradual, wavy boundary.

B23t--32 to 44 inches, light yellowish-brown (2.5Y 6/4) loam; common, medium, distinct mottles of strong brown (7.5YR 5/6) and common, coarse, distinct mottles of light gray (10YR 7/1); moderate, coarse, subangular blocky structure; slightly firm; few vertical cracks filled with coarser, light-gray material; less than 5 percent plinthite; sand grains coated and bridged with clay; very strongly acid; gradual, wavy boundary.

B24t--44 to 74 inches, olive-yellow (2.5Y 6/6) loam; many, coarse, distinct mottles of strong brown (7.5YR 5/6); common, medium, prominent mottles of red (2.5YR 4/6); common, coarse, distinct mottles of light gray (10YR 7/1); coarse, columnar structure breaking to moderate, medium, angular and subangular blocky; firm; cracks filled with coarser textured; light-gray material; sand grains coated and bridged with clay; few, patchy clay films; very strongly acid.

The A1 horizon is dark gray, very dark gray, dark grayish brown, or brown. The A1 horizon ranges from 2 to 6 inches in thickness. The Bt horizon is brown, strong brown, yellowish brown, light yellowish brown, or brownish yellow. Grayish mottles are in the uppermost 30 inches. The Bt horizon is loam and sandy loam. Clay makes up 10 to 18 percent of the uppermost 20 inches of the Bt horizon. Silt makes up 30 to 40 percent.

Harleston soils are geographically associated with Basin, Benndale, and Rumford soils. They are better drained than Basin soils, and they lack the fragipan and plinthite of those soils. They are not so well drained as Benndale soils. They have a thicker solum than Rumford soils, more than 60 inches, and they are not so well drained.

Harleston fine sandy loam, 0 to 2 percent slopes (HaA).--This is a moderately well drained soil on uplands. It has the profile described as representative of the series. Included in mapping were areas of Rumford, Benndale, and Basin soils. Also included were soils in which soft red nodules make up more than 5 percent of the lower layers.

This soil is very strongly acid. The available water capacity is moderate, and permeability is moderate. Runoff is slow. This soil can be cultivated continuously without risk of severe erosion.

Most of this soil is used for woodland, but a small acreage is used for cultivated crops and pasture. Corn, millet, oats, wheat, sorghum, soybeans, truck crops, crimson clover, arrowleaf, white clover, ball clover, ryegrass, sudangrass, bahiagrass, Coastal bermudagrass, and pecan and pine trees are suited. Excess surface water can be removed by using surface field ditches and arranging the crop rows on a slight grade so that the furrows help to drain the soil. (Capability unit IIw-1; woodland group 2w8; woodland forage site 1; wildlife group 3)

Harleston fine sandy loam, 2 to 5 percent slopes (HaB).--This soil occurs on uplands. It has a surface layer of dark-gray fine sandy loam about 5 inches thick. This layer is underlain by brownish-yellow sandy loam to a depth of about 22 inches. Below this depth is sandy loam mottled with red, yellow, and gray. Included in mapping were Benndale and Basin soils. Also included were areas that have a layer of mottled clay loam at a depth below 40 inches.

This soil is very strongly acid. The available water capacity is moderate, and permeability is moderate. Runoff is slow to medium.

Most of this soil is used for woodland, but a small acreage is used for crops or pasture. Corn, millet, oats, sorghum, soybeans, truck crops, arrowleaf, crimson clover, white clover, ryegrass, sudangrass, bahiagrass, Coastal bermudagrass, and pecan and pine trees are suited. Erosion is a hazard on cropland, but it can be controlled by the use of conservation cropping systems and supporting mechanical practices. Grassed waterways, stripcropping, and parallel terraces should be used where needed. (Capability unit IIe-2; woodland group 2w8; woodland forage site 1; wildlife group 3)

Johnston Series

The Johnston series consists of very poorly drained, strongly acid soils. These soils have a thick, dark-colored surface layer. They formed in loamy material. The water table is at or near the surface most of the time unless the soil is artificially drained.

In a representative profile the surface layer is very dark grayish-brown mucky silt loam about 3 inches thick. The subsurface layer is very dark gray very fine sandy loam about 29 inches thick. Below this layer, to a depth of about 69 inches, is light-gray sandy loam.

In this county, Johnston soils are mapped only in an association with Dorovan soils.

Representative profile of Johnston silt loam, on White Creek, 4 1/2 miles south and 1 1/8 miles west of Lucedale, on gravel road, 1/4 mile east of church, SE1/4 SE1/4 sec. 20, T. 2 S., R. 6 W.

A11--0 to 3 inches, very dark grayish-brown (10YR 3/2) mucky silt loam; massive; nonsticky when wet; many fine and medium roots; partly decayed vegetation; strongly acid; saturated with water; clear, smooth boundary.

A12--3 to 32 inches, very dark gray (10YR 3/1) very fine sandy loam; structureless; nonsticky when wet; many fine to coarse roots; saturated with water; strongly acid; clear, smooth boundary.

C2g--32 to 69 inches, light-gray (10YR 7/2) sandy loam; single grain; saturated with water; slightly sticky; few roots; strongly acid.

The A11 horizon is black, very dark gray, very dark grayish brown, or very dark brown. The A horizon ranges from 25 to 60 inches in thickness. The texture of this horizon is very fine sandy loam, loam, or silt loam. The upper part commonly is mucky silt loam. The C horizon is gray or light gray. Its texture is normally sandy loam but ranges from loamy sand to fine sandy loam. These soils are saturated most of the year.

Johnston soils are geographically associated with Dorovan soils. These are mineral soils that have a loamy surface layer high in organic-matter content. By contrast, Dorovan soils have organic layers more than 60 inches thick.

Lakeland Series

The Lakeland series consists of excessively drained, very strongly acid soils that formed in sandy material. The slope ranges from 0 to 17 percent.

In a representative profile the surface layer is dark-gray loose sand about 5 inches thick. The subsurface layer is grayish-brown loose sand about 4 inches thick. This is underlain by mixed light-gray and yellow sand about 5 inches thick. Below this layer, to a depth of about 55 inches, is brownish-yellow to reddish-yellow sand. The underlying material is mottled reddish-yellow and pink sand.

Representative profile of Lakeland sand, 0 to 5 percent slopes, in a wooded area 1/2 mile south of Palestine Gardens and 3/4 mile south of the Greene County line, SE1/4 NE1/4 sec. 6, T. 1 S., R. 8 W.

A11--0 to 5 inches, dark-gray (10YR 4/1) sand; weak, fine, granular structure; loose; many fine roots and some partly decayed leaves and twigs; very strongly acid; clear, wavy boundary.

A12--5 to 9 inches, grayish-brown (10YR 5/2) sand; single grain; loose; few fine and medium roots; very strongly acid; gradual, wavy boundary.

C1--9 to 14 inches, mixed light-gray (10YR 7/2) and yellow (10YR 7/6) sand; single grain; loose; very strongly acid; gradual, wavy boundary.

C2--14 to 32 inches, brownish-yellow (10YR 6/6) sand; single grain; loose; few grayish-brown organic stains on sand grains; very strongly acid; gradual, wavy boundary.

C3--32 to 55 inches, reddish-yellow (7.5YR 7/6) sand; single grain; loose; few medium roots; very strongly acid; diffuse, wavy boundary.

C4--55 to 65 inches, mottled reddish-yellow (5YR 6/8) and pink (5YR 7/4) sand; single grain; loose; very strongly acid.

The A11 horizon is dark gray, grayish brown, or dark grayish brown. It ranges from 2 to 7 inches in thickness. The A12 horizon ranges from grayish brown to yellowish brown in color and from 2 to 6 inches in thickness. The C horizon ranges from yellowish brown to brownish yellow, yellow, very pale brown, or reddish yellow in color. The content of clay and silt is less than 10 percent in the upper 50 inches of the C horizon.

Lakeland soils are geographically associated with Alaga, Eustis, and McLaurin soils. They are coarser textured than Alaga soils and slightly coarser textured than Eustis soils. They are coarser textured than McLaurin soils, which have a clay content of 10 to 18 percent. They lack the yellowish-red Bt horizon of McLaurin and Eustis soils.

Lakeland sand, 0 to 5 percent slopes (LeB).--This soil occurs on uplands. It has the profile described as representative of the series. Included in mapping were small areas of Eustis and Alaga soils. Also included were a few small areas that contain loamy material at a depth of less than 70 inches.

This soil is very strongly acid. Permeability is rapid, and the available water capacity is low. Runoff is slow.

Nearly all of this soil is in woodland. Pine trees are suited, but they are difficult to establish. The available water capacity is generally too low for most crop and pasture plants. (Capability

unit IVs-2; woodland group 4s3; woodland forage site 2; wildlife group 2)

Lakeland sand, 5 to 17 percent slopes (LeE).--This soil occurs mostly on side slopes. The surface layer is very dark gray loose sand about 2 inches thick. Below this, to a depth of more than 70 inches, is yellowish-brown, yellow, and very pale brown loose sand. Included in mapping were small areas of Alaga, Eustis, and McLaurin soils. Also included were a few small areas that contain loamy material at a depth of less than 70 inches.

This soil is very strongly acid. Permeability is rapid, and the available water capacity is low. Runoff is slow.

Most of this soil is in woodland. Pine trees are suited, but they are difficult to establish. The available water capacity is too low for most crop and pasture plants. (Capability unit VIIs-2; woodland group 4s3; woodland forage site 2; wildlife group 2)

Leaf Series

The Leaf series consists of poorly drained, strongly acid, nearly level or depressional soils on flood plains. They formed in clayey material.

In a representative profile the surface layer is dark grayish-brown silt loam about 5 inches thick. Below this layer, to a depth of about 55 inches, is light brownish-gray, light-gray, and gray material that is mostly silty clay. This layer is mottled with gray and yellow.

Representative profile of Leaf silt loam (0 to 2 percent slopes), in a wooded area of the Pascagoula River flood plain, 5 feet south of pipeline right-of-way and 1/4 mile south of lake bridge on road between Merrill and Mississippi Highway 57, 1 mile southeast of store, NE1/4 SE1/4 sec. 25, T. 1 S., R. 8 W.

A1--0 to 5 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, angular and subangular blocky structure; friable; many tree roots; strongly acid; clear, smooth boundary.

B21tg--5 to 11 inches, light brownish-gray (10YR 6/2) silty clay loam; few, fine, faint mottles of gray; moderate, fine and medium, subangular blocky structure; friable; clay films on ped surfaces; strongly acid; clear, smooth boundary.

B22tg--11 to 22 inches, light brownish-gray (10YR 6/2) silty clay; common, fine, faint mottles of gray; strong, fine and medium, angular and subangular blocky structure; firm, plastic and sticky; clay films on ped faces; strongly acid; gradual, wavy boundary.

B23tg--22 to 43 inches, light-gray (10YR 7/2) silty clay; common, fine, distinct mottles of reddish yellow; moderate, fine, angular blocky structure; firm, plastic and sticky; clay films on ped surfaces; strongly acid; gradual, wavy boundary.

B3g--43 to 55 inches, gray (10YR 6/1) silty clay; weak, fine, angular blocky structure; wet, plastic and sticky; few, fine, soft, dark-brown concretions; strongly acid.

The A1 horizon is dark gray, very dark gray, or dark grayish brown. The texture of this horizon is dominantly silt loam, but it ranges to fine sandy loam or loam. The A1 horizon ranges from 1 to 5 inches in thickness. The Bt horizon is light gray, gray, or light brownish gray. Mottles in the Bt horizon range from few to many and are gray, brown, red, and yellow. The texture of the Bt horizon ranges from clay to silty clay loam.

Leaf soils are geographically associated with Lenoir soils, but they are more poorly drained than those soils.

Leaf-Lenoir association (Lf).--This association consists of poorly drained to somewhat poorly drained soils on flood plains. The flood plains range from 1/4 mile to 6 miles in width and are characterized by oxbow lakes and old stream channels.

The Leaf soils make up about 36 percent of the association, and the Lenoir soils about 14 percent. Included in mapping were areas of well-drained silty and loamy soils that generally occur along higher natural levees bordering old stream channels.

The poorly drained Leaf soils are in low, flat areas and depressions. They formed in slack-water deposits. These soils have the profile described as representative of the series.

The Leaf soils are strongly acid. The available water capacity is high; permeability is slow. Runoff is very slow, and water ponds during wet periods.

The somewhat poorly drained Lenoir soils occur at slightly higher elevations than the Leaf soils. The Lenoir soils have a surface layer of very dark gray silt loam about 6 inches thick. This layer, about 8 inches thick, is underlain by loam mottled with brown and gray. Below this is clay mottled with yellow, red, brown, and gray. The gray material increases with depth.

The Lenoir soils are strongly acid. The available water capacity is high. Permeability is slow, and runoff is slow.

Nearly all of this association is in hardwood forest. Low-lying areas are flooded several times a year and are unsuitable for cultivation. Natural levees and other higher areas are flooded less frequently and are suited to cultivated crops and pasture. Bottom-land hardwoods are suited. Loblolly, slash, and spruce pine are suited, but, in places, desirable trees are difficult to establish because of competition from less desirable plants. (Capability unit IVw-1; woodland group 2w9; woodland forage site 3; woodland group 3)

Lenoir Series

The Lenoir series consists of somewhat poorly drained, strongly acid soils. These soils formed in clayey material. They are nearly level.

In a representative profile the surface layer is very dark gray silt loam about 6 inches thick. The next layer, about 8 inches thick, is loam mottled with brown and gray. Below this, to a depth of about 60 inches, is clay that is mottled with gray and brown. The gray material increases with depth.

Representative profile of Lenoir silt loam, 0 to 2 percent slopes, 0.75 mile northwest of the Alabama State line on U.S. Highway 98, 1/4 mile northeast on field road and 80 feet west into field, NW1/4 SW1/4 sec. 18, T. 2 S., R. 4 W.

Ap--0 to 6 inches, very dark gray (10YR 3/1) silt loam; weak, medium, granular structure; friable; strongly acid; abrupt, smooth boundary.

B1t--6 to 14 inches, mottled light yellowish-brown (10YR 6/4) and light brownish-gray (10YR 6/2) loam; weak, medium, subangular blocky structure; friable; few patchy clay films; strongly acid; clear, wavy boundary.

B21tg--14 to 25 inches, mottled light brownish-gray (10YR 6/2) and reddish-brown (2.5YR 5/4) clay; weak, fine, angular blocky structure; firm, plastic and sticky; clay films on ped faces; strongly acid; gradual, wavy boundary.

B22tg--25 to 38 inches, mottled gray (10YR 5/1), yellowish-brown (10YR 5/8), and reddish-brown (2.5YR 5/4) clay; weak, fine, angular blocky structure; firm, plastic and sticky; clay films on ped faces; strongly acid; gradual, wavy boundary.

B23tg--38 to 60 inches, gray (10YR 6/1) clay; common, medium, distinct, reddish-yellow mottles; weak, fine, angular blocky structure; firm, plastic and sticky; clay films on ped faces; strongly acid.

The A1 horizon is very dark gray, very dark brown, or dark grayish brown. The texture of the B1t horizon is silt loam, silty clay loam, or loam. The B1t horizon is very pale brown, light yellowish brown, or yellowish brown, or it is mottled with gray, brown, and yellow. The B2t horizon is gray or light brownish gray mottled with brown and yellow. The texture of the B2t horizon ranges from clay loam to clay. Black and brown concretions are few to common throughout the solum.

Some of these soils are outside the defined range for the series. They have a high content of fine silt, and clay makes up slightly less than 35 percent of the uppermost 20 inches of the Bt horizon. This difference, however, does not alter the usefulness or behavior of the soils.

Lenoir soils are associated with Angie, Atmore, Leaf, and Rumford soils. They are more poorly drained than Angie soils and have a grayer Bt horizon. They are finer textured and better drained than Atmore soils. They are browner in the upper part of the solum than Leaf soils and are finer textured and more poorly drained than Rumford soils.

Lenoir silt loam (Ln).--This soil is adjacent to flood plains. It is nearly level. Included in mapping were soils that are similar to Lenoir soils, except that clay makes up less than 35 percent of the Bt horizon. Also included were small areas of Atmore, Angie, Rumford, and Leaf soils. In some areas the surface layer is very fine sandy loam.

This soil is strongly acid. The available water capacity is moderate to high. Permeability is slow. Runoff is slow. Surface drainage is needed if this soil is cultivated. Wet periods can cause a delay of several days in cultivation.

Most of this soil is in woodland, but a small part is in cultivation or is used for pasture. If adequate drainage is provided, selected truck crops, corn, soybeans, small grains, white clover, tall fescue, bahiagrass, and Coastal bermudagrass are suited. Pine trees and selected hardwoods are suited. (Capability unit IIIw-1; woodland group 2w8; woodland forage site 3; wildlife group 3)

Lucedale Series

The Lucedale series consists of well-drained, strongly acid soils that formed in heavy, loamy material. The slope ranges from 0 to 5 percent.

In a representative profile the surface layer is dark reddish-brown sandy loam about 8 inches thick. This layer is underlain by dark reddish-brown sandy clay loam about 7 inches thick. Below this, to a depth of about 60 inches, is dark-red clay loam and sandy clay loam.

Representative profile of Lucedale sandy loam, 0 to 2 percent slopes, in a cultivated area, 400 yards southwest of cattle farm, SW1/4 SE1/4 sec. 31, T. 2 S., R. 5 W.

Ap--0 to 8 inches, dark reddish-brown (5YR 3/2) sandy loam; weak, fine, granular structure and weak, medium, subangular blocky; friable; strongly acid.

B1t--8 to 15 inches, dark reddish-brown (2.5YR 3/4) sandy clay loam; weak, medium and coarse, subangular blocky structure; friable; many fine roots; sand grains coated and bridged; patchy clay films on ped faces and in cracks; strongly acid; gradual, smooth boundary.

B21t--15 to 40 inches, dark-red (2.5YR 3/6) clay loam; moderate, medium and coarse, subangular blocky structure; friable; few fine roots; sand grains coated and bridged; clay films on ped faces and in cracks; strongly acid; gradual, smooth boundary.

B22t--40 to 60 inches +, dark-red (2.5YR 3/6) sandy clay loam; weak, medium, subangular blocky structure; friable; sand grains coated and bridged; strongly acid.

The Ap horizon is dark reddish brown, dark red, or dark brown. It ranges from 4 to 10 inches in thickness. The Bt horizon is dark reddish brown and dark red. The texture of the Bt horizon is sandy clay loam, clay loam, or heavy loam.

Lucedale soils are geographically associated with McLaurin and Myatt soils. They are redder and finer textured in the B horizon than McLaurin soils. They

are well drained; by contrast, the Myatt soils are poorly drained.

Lucedale sandy loam, 0 to 2 percent slopes (LuA).--This soil occurs on broad upland flats. It has the profile described as representative of the series. Included in mapping were a few small areas of McLaurin, Myatt, and Eustis soils.

This soil is strongly acid. Permeability is moderate, and runoff is slow. The available water capacity is moderate to high.

About 95 percent of this soil is cultivated or is used for pasture. The rest is in woodland. Corn, soybeans, small grain, ryegrass, millet, truck crops, bahiagrass, Coastal bermudagrass, and pecan, tung, and pine trees are well suited (see pl. I). Row crops can be grown year after year if good management practices are used. This soil is easy to till and can be cultivated throughout a wide range of moisture content without risk of crusting or packing. (Capability unit I-1; woodland group 2o1; woodland forage site 1; wildlife group 1)

Lucedale sandy loam, 2 to 5 percent slopes (LuB).--This is a dark-colored soil on uplands. The surface layer is dark-brown sandy loam about 7 inches thick. It is underlain, to a depth of more than 60 inches, by dark reddish-brown or dark-red sandy clay loam. Included in mapping were small areas of McLaurin, Eustis, and Myatt soils.

This soil is strongly acid. Permeability is moderate. The available water capacity is moderate to high. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

Most of this soil is used for row crops and pasture; a small acreage is in woodland. Corn, soybeans, small grain, ryegrass, millet, truck crops, bahiagrass, Coastal bermudagrass, and pecan, tung, and pine trees are well suited. Erosion is a hazard if the soil is cultivated, but it can be controlled by the use of a conservation cropping system and supporting mechanical practices. Grassed waterways, stripcropping, and parallel terracing should be used where needed. (Capability unit IIe-1; woodland group 2o1; woodland forage site 1; wildlife group 1)

McLaurin Series

The McLaurin series consists of well-drained, strongly acid or very strongly acid soils that formed in loamy material. The slope ranges from 0 to 12 percent.

In a representative profile the surface layer is very dark grayish-brown fine sandy loam about 5 inches thick. The subsurface layer is yellowish-brown sandy loam about 8 inches thick. Below this, to a depth of about 70 inches, is yellowish-red sandy loam. The underlying material is yellowish-red loamy sand.

Representative profile of McLaurin fine sandy loam, 0 to 2 percent slopes, on a broad, wooded ridgetop, 1.8 mile south of Mississippi Highway 26, on Highway 57, 40 feet southwest of junction with woods road, NE1/4 NW1/4 sec. 28, T. 2 S., R. 8 W.

A1--0 to 5 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; moderate, medium, granular structure and weak, medium, subangular blocky; very friable; many grass roots and few tree roots; very strongly acid; clear, smooth boundary.

A2--5 to 13 inches, yellowish-brown (10YR 5/4) sandy loam; many, fine, distinct, very dark grayish-brown mottles; moderate, medium, granular structure and weak, medium, subangular blocky; very friable; worm casts and root channels filled with material from A1 horizon; many grass roots and tree roots; very strongly acid; clear, wavy boundary.

B1t--13 to 19 inches, yellowish-red (5YR 5/6) sandy loam; weak, medium, subangular blocky structure; very friable; sand grains bridged and coated with clay; few fine roots; strongly acid; gradual, smooth boundary.

B21t--19 to 34 inches, yellowish-red (5YR 4/8) sandy loam; weak to moderate, medium and coarse, subangular blocky structure; friable; sand grains bridged and coated with clay; patchy clay films; few fine roots; strongly acid; gradual, smooth boundary.

B22t--34 to 70 inches, yellowish-red (5YR 4/8) sandy loam; weak, coarse, subangular blocky structure; very friable; sand grains bridged and coated with clay; very strongly acid; diffuse, irregular boundary.

C--70 to 80 inches +, yellowish-red (5YR 5/8) loamy sand; single grain; very friable to loose; sand grains bridged and coated with clay; very strongly acid.

The A1 horizon is very dark grayish brown, dark grayish brown, or grayish brown and ranges from 3 to 7 inches in thickness. The A2 horizon is yellowish brown or brown. The Bt horizon is dominantly yellowish red but ranges to red. The texture of the Bt horizon is dominantly sandy loam but ranges to loam. In some profiles there is an A'2 horizon in the lower part of the solum.

McLaurin soils are geographically associated with Alaga, Benndale, Eustis, and Lucedale soils. McLaurin soils are finer textured throughout than Alaga soils, and they are redder in the B horizon than Benndale soils. They are finer textured than the sandy Eustis soils. They are not so red as Lucedale soils, and they contain less clay in the uppermost 20 inches of the Bt horizon than those soils.

McLaurin fine sandy loam, 0 to 2 percent slopes (MlA).--This soil is on ridgetops. It has the profile described as representative of the series. Included in mapping were a few small areas that have a surface layer of loamy sand.

This soil is strongly acid or very strongly acid. The available water capacity is moderate to low. Permeability is moderate, and runoff is slow.

Most of this soil is cultivated or is used for pasture, but a small part is used for woodland. Corn (see pl. I), small grain, truck crops, crimson clover, ball clover, arrowleaf, millet, ryegrass, sudangrass, bahiagrass, Coastal bermudagrass, legumes, and pecan, tung, and pine trees are well suited. This soil can be cultivated throughout a wide range of moisture content without risk of crusting or packing. It can be cultivated year after year; the hazard of erosion is no more than slight. Good conservation practices are necessary, however, if row crops are grown. This soil tends to be slightly droughty. (Capability unit IIs-1; woodland group 2o1; woodland forage site 1; wildlife group 1)

McLaurin fine sandy loam, 2 to 5 percent slopes (MlB).--This soil occurs on uplands. It has a surface layer of dark grayish-brown fine sandy loam about 4 inches thick. This layer is underlain by yellowish-red sandy loam to a depth of about 70 inches. Included in mapping were small areas of Eustis, Benndale, and Lucedale soils. In a few areas the surface layer has been thinned by erosion. Also, in a few areas the surface layer is loamy sand.

This soil is strongly acid or very strongly acid. The available water capacity is moderate to low. Permeability is moderate, and runoff is slow.

Most of this soil is used for woodland, but a small part is used for crops and pasture. Corn, small grain, truck crops, ryegrass, sudangrass, bahiagrass, Coastal bermudagrass, legumes, and pecan, tung, and pine trees are well suited. Erosion is a hazard on cropland, but it can be controlled by the use of conservation cropping systems and supporting mechanical practices. Grassed waterways, stripcropping, and parallel terraces should be used where needed. This soil can be cultivated throughout a wide range of moisture content without risk of crusting or packing. It tends to be slightly droughty. (Capability unit IIe-1; woodland group 2o1; woodland forage site 1; wildlife group 1)

McLaurin fine sandy loam, 5 to 8 percent slopes (MlC).--This soil is on side slopes. The surface layer is dark grayish-brown fine sandy loam about 6 inches thick. This layer, to a depth of about 60 inches, is underlain by yellowish-red sandy loam. Included in mapping were small areas of Eustis, Benndale, and Lucedale soils. In some areas the surface layer has been thinned by erosion. In a few small areas, the surface layer is loamy sand.

This soil is strongly acid or very strongly acid. The available water capacity is moderate to low. Permeability is moderate. Runoff is medium, and the erosion hazard is moderate.

Most of this soil is in woodland, but a small part is in pasture and cultivation. Corn, small grain, ryegrass, sudangrass, bahiagrass, Coastal bermudagrass, legumes, and pecan, tung, and pine trees are well suited.

Erosion is a hazard on cropland, but it can be controlled by the use of an adequate cropping system, such as 1 year or row crops and 2 years of small grain. Supporting mechanical practices, such as stripcropping, parallel terraces, and grassed waterways, should be used. This soil tends to be slightly droughty. (Capability unit IIIe-1; woodland group 2o1; woodland forage site 1; wildlife group 1)

McLaurin fine sandy loam, 8 to 12 percent slopes (MlD).--This soil is on side slopes. The surface layer is dark grayish-brown fine sandy loam about 6 inches thick. This layer, to a depth of more than 60 inches, is underlain by yellowish-red sandy loam. Included in mapping were a few areas of Benndale and Harleston soils. In some areas the surface layer has been thinned by erosion and yellowish-red sandy loam is exposed.

This soil is strongly acid or very strongly acid. The available water capacity is moderate to low. Permeability is moderate. Runoff is medium to rapid, and, if ground cover is removed, the erosion hazard is severe.

Most of this soil is used for woodland, but a small acreage is in pasture. Bahiagrass, Coastal bermudagrass, and pecan, tung, and pine trees are well suited. This soil is better suited to pasture and orchards than to row crops. If it is used for crops, conservation measures are needed to control erosion. Rotations, such as 3 years of close-growing crops and 1 year of row crops, are suitable. In addition, such practices as stripcropping and grassed waterways are needed. (Capability unit IVe-1; woodland group 2o1; woodland forage site 1; wildlife group 1)

Myatt Series

The Myatt series consists of poorly drained, strongly acid soils. These soils formed in loamy material in small depressions. They are nearly level.

In a representative profile the surface layer is gray silt loam about 5 inches thick. The subsurface layer is light brownish-gray silt loam about 133 inches thick. Below this layer, to a depth of about 64 inches, is light brownish-gray to gray heavy loam, loam, or clay loam mottled with shades of yellow, brown, and red.

Representative profile of Myatt silt loam, 0 to 2 percent slopes, in a wooded area, 1/4 mile north and 0.3 mile west of Cooks Corner, 60 feet east of dry pond, SW1/4 SE1/4 sec. 23, T. 2 S., R. 6 W.

A1--0 to 5 inches, gray (10YR 6/1) silt loam; few, fine, distinct mottles of olive yellow; moderate, fine and medium, granular structure; friable; strongly acid; clear, smooth boundary.

A2g--5 to 18 inches, light brownish-gray (2.5Y 6/2) silt loam; many, fine, distinct mottles of yellowish brown; moderate, fine and medium, granular structure; friable; many wormholes; yellowish-brown root mottling; strongly acid; clear, smooth boundary.

B21tg--18 to 36 inches, light brownish-gray (10YR 6/2) heavy loam; many, medium, distinct mottles of brownish yellow; many, fine, distinct mottles of yellow; few, fine, prominent mottles of yellowish red; moderate, medium, subangular blocky structure; friable; sand grains coated and bridged with clay; few patchy clay films; some yellowish-red plinthite (less than 10 percent by volume); strongly acid; clear, smooth boundary.

B22tg--36 to 48 inches, light brownish-gray (10YR 6/2) heavy loam; common, medium, distinct mottles of reddish yellow; moderate, medium, subangular blocky structure; friable; sand coated and bridged with clay; few patchy clay films; strongly acid; clear, smooth boundary.

B23tg--48 to 54 inches, light-gray (10YR 7/1) loam; many, medium, distinct mottles of yellowish brown; common, medium, distinct mottles of brownish yellow; few, fine, prominent mottles of red; moderate, medium, subangular blocky structure; friable; sand coated and bridged with clay; few patchy clay films; strongly acid; clear, smooth boundary.

B24tg--54 to 64 inches +, light-gray (10YR 7/1) clay loam; many, medium, prominent mottles of reddish brown; common, medium, distinct mottles of brownish yellow; moderate, medium, subangular blocky structure; friable; sand coated and bridged with clay; few patchy clay films; strongly acid.

The A1 horizon is gray, very dark gray, dark gray, or grayish brown. It ranges from 2 to 10 inches in thickness. The A2 horizon is light brownish gray or gray and ranges from 9 to 17 inches in thickness. The Bt horizon is gray, light gray, or light brownish gray. Mottles in this horizon are few to common in shades of red, brown, and yellow. The texture of the Bt horizon is loam, clay loam, silty clay loam, and sandy clay loam.

Myatt soils are geographically associated with Lucedale and McLaurin soils. They are poorly drained; Lucedale and McLaurin soils are well drained.

Myatt silt loam, 0 to 2 percent slopes (MyA).--This soil is in depressions. Included in mapping were small areas of Leaf soils, shallow muck underlain by clay or silty clay, and soils that have layers of sand at varying depths. In some areas soft, yellowish-red nodules make up more than 5 percent of the soil material.

This soil is strongly acid. The available water capacity is moderate. Except during periods of prolonged drought, recharge is rapid because of the position on the landscape. Permeability is moderately slow, and ponding for long periods after a rain is common.

Most of the acreage is in woodland, but about 10 percent is in pasture. One of the most important uses of this soil is for dug ponds, which provide stock water. If adequately drained, the soil is suited to tall fescue, white clover, annual lespedeza, sorghum, and millet. Loblolly pine, slash pine, and selected hardwoods are suited. (Capability unit IVw-1; woodland group 2w9; woodland forage site 3; wildlife group 3)

Rumford Series

The Rumford series consists of well-drained, strongly acid or very strongly acid soils that formed in loamy and sandy material. They are nearly level.

In a representative profile the surface layer is dark-brown sandy loam about 7 inches thick. The subsurface layer is yellowish-brown sandy loam about 9 inches thick. Below this layer, to a depth of about 42 inches, is yellowish-brown sandy loam. The underlying material is yellow or light-gray sand mottled with brown and white.

Representative profile of Rumford sandy loam, 0 to 2 percent slopes, 10 1/2 miles west of Lucedale on dirt road and 0.3 mile west on woods road, 1/4 mile north of southeast corner of sec. 12, T. 2 S., R. 8 W.

Ap--0 to 7 inches, dark-brown (10YR 4/3) sandy loam; weak, fine and medium, granular structure; very friable; many grass roots; few medium tree roots; strongly acid; clear, smooth boundary.

A2--7 to 16 inches, yellowish-brown (10YR 5/4) sandy loam; many, common, distinct, dark-brown mottles; weak, medium, granular structure; very friable; few fine grass roots; few medium tree roots; very strongly acid; clear, wavy boundary.

B1t--16 to 21 inches, yellowish-brown (10YR 5/6) sandy loam; weak, medium, subangular blocky structure; friable; few medium tree roots; clay bridging and coating of sand grains; less than 10 percent of sand grains stripped; very strongly acid; gradual, smooth boundary.

B2t--21 to 42 inches, yellowish-brown (10YR 5/6) sandy loam; few, medium, distinct, white mottles and many, medium, faint, light yellowish-brown mottles; weak, medium, subangular blocky structure; friable; few medium tree roots; few fine areas of stripped sand grains; clay bridging and coating of sand grains; very strongly acid; gradual, wavy boundary.

IIC1--42 to 56 inches, yellow (10YR 7/6) sand; many, coarse, faint, very pale brown (10YR 7/3) mottles; common, medium, distinct, white mottles and few, fine, distinct, strong-brown mottles; single grain; loose; very strongly acid; gradual, wavy boundary.

IIC2--56 to 65 inches +, light-gray (10YR 7/2) sand; many, coarse, faint, white (10YR 8/1) mottles; single grain; loose; very strongly acid.

The A1 horizon is dark gray, dark grayish brown, or dark brown. The A2 horizon is grayish brown, brown, or yellowish brown. It ranges from 4 to 10 inches in thickness. The Bt horizon is dominantly yellowish brown but ranges to strong brown. The

texture of this horizon ranges from sandy loam to loam. Clay makes up 10 to 18 percent of the upper 20 inches of the Bt horizon. The thickness of this horizon ranges from 15 to 50 inches.

Rumford soils are geographically associated with Alaga, Atmore, Cahaba, and Lenoir soils. They are finer textured than Alaga soils. They are better drained than Atmore soils, and they lack the Bx horizon that contains plinthite, which those soils have. Rumford soils are coarser textured in the upper 20 inches of the Bt horizon than Cahaba soils. They are better drained and less clayey than Lenoir soils.

Rumford sandy loam, 0 to 2 percent slopes (RuA).--This soil is adjacent to the flood plains of major streams. Included in mapping were small areas of Alaga, Benndale, and Cahaba soils. Also included were some areas that have a surface layer of loamy sand.

This soil is strongly acid or very strongly acid. The available water capacity is moderate to low. Permeability is moderately rapid, and runoff is slow.

Most of this soil is used for woodland, but a small acreage is cultivated or is used for pasture. Corn, oats, millet, sorghum, soybeans, wheat, truck crops, bahiagrass, Coastal bermudagrass, crimson clover, ball clover, arrowleaf, and pecan and pine trees are suited. Good conservation practices are necessary for row crops. This soil can be cultivated soon after a rain without clodding or crusting. It tends to be slightly droughty. (Capability unit IIs-1; woodland group 2o7; woodland forage site 1; wildlife group 3)

Susquehanna Series

The Susquehanna series consists of somewhat poorly drained, strongly acid soils that formed in clayey material. The slope ranges from 2 to 17 percent. These soils have cracks to a depth of more than 20 inches during dry periods.

In a representative profile the surface layer is dark-gray fine sandy loam about 3 inches thick. The subsurface layer is yellowish-brown sandy loam about 2 inches thick. This is underlain, to a depth of about 9 inches, by yellowish-red clay mottled with strong brown. Below this layer, to a depth of more than 77 inches, is clay that is mottled with shades of gray, red, and brown.

Representative profile of Susquehanna fine sandy loam, 2 to 5 percent slopes, in a wooded area, 3 miles north of Mississippi Highway 26, 1 1/4 miles north of gravel road, on first woods road north of Big Creek, 75 feet west of pipeline, 50 feet north of woods road, SW1/4 SE1/4 sec. 27, T. 1 S., R. 7 W.

A1--0 to 3 inches, dark-gray (10YR 4/1) fine sandy loam; weak, fine and medium, granular structure; friable; many fine grass roots; strongly acid; abrupt, wavy boundary.

A2--3 to 5 inches, yellowish-brown (10YR 5/4) sandy loam; few, fine, distinct mottles of strong brown and few, fine, distinct mottles of dark gray; weak, medium, granular structure and weak, medium, subangular blocky; friable; many fine grass roots; mixing of adjacent horizons by earthworm activity; strongly acid; clear, wavy boundary.

B1t--5 to 9 inches, yellowish-red (5YR 4/6) clay; few, fine, distinct mottles of strong brown; moderate, fine and medium, subangular blocky structure; firm, plastic and sticky when wet; many fine grass roots; cracks filled with overlying material; continuous clay films; strongly acid; clear, wavy boundary.

B21tg--9 to 13 inches, mottled light brownish-gray (2.5Y 6/2), red (10R 4/6), and light-gray (10YR 7/2) clay; strong, fine and medium, subangular blocky structure and strong, medium, angular blocky; firm, plastic and sticky when wet; few fine grass roots; continuous clay films; strongly acid; clear, wavy boundary.

B22tg--13 to 28 inches, mottled light brownish-gray (10YR 6/2) and red (10R 4/6) clay; strong, fine and medium, angular blocky structure; firm, plastic and sticky when wet; few fine grass roots; continuous clay films; strongly acid; gradual, wavy boundary.

B23tg--28 to 51 inches, light-gray (2.5Y 7/2) clay; common, fine, prominent mottles of dark red and few, fine, distinct mottles of strong brown; strong, coarse, angular blocky structure; very firm; few fine grass roots between peds; continuous clay films; strongly acid; gradual, wavy boundary.

B24t--51 to 73 inches, strong-brown (7.5YR 5/6) clay; many, coarse, prominent mottles of light gray (5Y 7/2) and few, medium, faint mottles of strong brown (7.5YR 5/8); strong, fine, angular blocky structure; very firm; continuous clay films and few slickensides, about 6 inches across, that do not intersect; strongly acid; gradual, wavy boundary.

C--73 to 77 inches, light-gray (5Y 7/2) clay; common, fine, distinct mottles of strong brown; strong, fine, angular blocky structure; very firm; slickensides that intersect and tilt about 30 degrees from the horizontal; strongly acid.

The A1 horizon is dark gray, dark grayish brown, or grayish brown. It ranges from 2 to 5 inches in thickness. The texture of this horizon is fine sandy loam, loam, or sandy loam. The Bt horizon is dark yellowish brown, yellowish brown, brown, or yellowish red; in places it is mottled with shades of yellow, red, or brown. Grayish mottles in the upper 10 inches of the Bt horizon range from few to many. The texture of this horizon is dominantly clay but ranges from heavy clay loam to silty clay. The structure of the Bt horizon is strong to moderate.

Susquehanna soils are geographically associated with Atmore and Benndale soils. They are better drained and have a higher content of clay in the B horizon than Atmore soils. They are more poorly drained than Benndale soils, and they have a higher content of clay in the B horizon.

Susquehanna fine sandy loam, 2 to 5 percent slopes (SnB).--This soil is on uplands. It has the profile described as representative of the series. Included in mapping were small areas of soil that is yellowish-brown loam in the upper part but is less than 24 inches thick over clay. Some areas have a surface layer of silt loam or loam.

This soil has a high shrink-swell potential and cracks when dry. It is strongly acid. The available water capacity is moderate. Permeability is slow, and runoff is medium. If ground cover is removed, erosion is a moderate hazard.

Most of this soil is in woodland, but about 5 percent is in pasture. Little, if any, of the acreage is in cropland. Row crops are limited. Such crops as sorghum and millet are suited. Pine trees, bahiagrass, Coastal bermudagrass, dallisgrass, tall fescue, and small grain are suited. If the soil is cropped, grassed waterways, stripcropping, or parallel terraces should be used where needed. (Capability unit IVe-2; woodland group 3c2; woodland forage site 1; wildlife group 2)

Susquehanna fine sandy loam, 5 to 8 percent slopes (SnC).--This is a clayey soil on uplands. It occurs throughout the county. The surface layer is dark-gray fine sandy loam about 4 inches thick. This layer is underlain, to a depth of about 70 inches, by mottled gray, red, and yellow clay. Included in mapping were small areas of soils that are red to yellowish-red clay in the upper 18 inches immediately below the surface layer. Also included were a few areas that have a layer of yellowish-brown loam within the upper 24 inches. The surface layer has been thinned or removed by erosion in a few places.

This soil has a high shrink-swell potential and cracks when dry. It is strongly acid. The available water capacity is moderate. Permeability is slow, and runoff is medium to rapid. If ground cover is removed, erosion is a serious hazard.

Most of this soil is in woodland, but a small acreage is in pasture. Row crops are limited to sorghum and millet. Pine trees, bahiagrass, Coastal bermudagrass, and tall fescue are suited. If the soil is cropped, grassed waterways, stripcropping, or parallel terraces should be used where needed. (Capability unit VIe-2; woodland group 3c2; woodland forage site 1; wildlife group 2)

Susquehanna fine sandy loam, 8 to 12 percent slopes (SnD).--This soil is on uplands. It has a surface layer of grayish-brown fine sandy loam about 5 inches thick. This layer, to a depth of about 70 inches, is underlain by mottled red, yellowish-red, and gray clay. Included in mapping were small areas of soils that are yellowish-brown loam in the upper part but are less than 24 inches thick over clay. Also included were soils that have a layer, more than 10 inches thick, of red to yellowish-red clay immediately below the surface layer. In addition, small areas were included where the surface layer has been removed by erosion.

This soil has a high shrink-swell potential, and it cracks when dry. It is strongly acid. The available water capacity is moderate. Permeability is slow, and runoff is rapid.

Most of this soil is in pine and hardwood forest. Pine trees, bahiagrass, Coastal bermudagrass, tall fescue, and ball clover are suited. This soil erodes easily if the ground cover is removed. If the soil is used for pasture, grazing should be rotated or stocking rates adjusted to maintain a good ground cover at all times. (Capability unit VIe-2; woodland group 3c2; woodland forage site 1; wildlife group 2)

Susquehanna complex, 2 to 5 percent slopes (SuB).--This complex is on ridgetops and is generally in the vicinity of the heads of drainageways. Susquehanna soils make up the major part of this complex. Soils that are similar to the Susquehanna soils in texture but differ in being yellowish-red to red clay below the surface layer are also a part of this complex. Included in mapping were soils that have as much as 24 inches of loamy material underlying the surface layer. Also included were soils that are similar to the Susquehanna soils but are moderately well drained and occur on the middle and upper slopes. In addition, soils that have yellowish-brown loam below the surface layer were included. In some areas the surface layer has been thinned by erosion.

The somewhat poorly drained Susquehanna soil is on the lower parts of the slopes. This soil has a surface layer of dark-gray fine sandy loam, about 3 inches thick, underlain by mottled red, gray, and brown clay to clay loam. This soil has a high shrink-swell potential and cracks when dry. It is strongly acid. The available water capacity is moderate. Permeability is slow.

Nearly all the acreage is in woodland. Slow permeability and the medium rate of runoff make erosion a hazard on cropland. Row crops are limited, but such crops as sorghum and millet are suited. Pine trees, bahiagrass, Coastal bermudagrass, dallisgrass, and white clover are suited. If the soil is cropped, grassed waterways, stripcropping, or parallel terraces should be used where needed. (Capability unit IVe-2; woodland group 3c2; woodland forage site 1; wildlife group 2)

Susquehanna complex, 5 to 12 percent slopes (SuD).--This complex is on the points of ridges and in areas around the heads of drainageways that are less steep than the surrounding slopes. Susquehanna soils make up the major part of the complex. They have a surface layer of dark-gray fine sandy loam about 3 inches thick. This layer is underlain

by yellowish-red clay mottled with gray. The clay cracks when dry. Another soil in this complex is somewhat similar to the Susquehanna soil, but it has a layer of yellowish-brown sandy loam to loam underlying the surface layer. This is a moderately well drained, strongly acid soil on the middle and upper slopes. Small areas of Benndale soils and a few areas of soils that have yellowish-red sandy clay loam beneath the surface layer are included. These soils are on the upper slopes.

The soils of this complex are strongly acid. The available water capacity is moderate. Permeability is slow, and runoff is medium to rapid.

Nearly all of this complex is in woodland. Pine trees, bahiagrass, Coastal bermudagrass, and dallisgrass are suited. Erosion is a serious hazard if the ground cover is removed. If the soil is used for pasture, grazing should be rotated or stocking rates adjusted to maintain a ground cover at all times. (Capability unit VIe-2; woodland group 3c2; woodland forage site 1; wildlife group 2)

Susquehanna complex, 12 to 17 percent slopes (SuE).--This complex is on side slopes dissected by short drainageways. Susquehanna soils make up the major part of the complex and generally occupy the lower and middle slopes. The surface layer, about 5 inches thick, is grayish-brown fine sandy loam underlain by mottled yellowish-red, red, and gray clay that cracks when dry. The soils are strongly acid. The available water capacity is moderate, and permeability is slow. Runoff is rapid.

Some of the middle and upper slopes are occupied by a moderately well drained soil that has a grayish-brown sandy loam surface layer. This layer is underlain by mottled yellowish-brown, yellowish-red, and gray clay loam, 5 to 15 inches thick, over gray clay mottled with red and strong brown. This soil is strongly acid. The available water capacity is moderate. Permeability is moderate in the upper part of the subsoil and slow in the lower part. Runoff is rapid.

The upper slopes and a few narrow ridgetops are occupied by well-drained soils that have yellowish-red sandy clay loam underlying the surface layer.

Nearly all of this complex is in woodland. The soils are too steep for most crops and pasture plants. The erosion hazard is severe. Pine trees are suited. (Capability unit VIIe-1; woodland group 3c2; woodland forage site 1; wildlife group 2)

Susquehanna-Benndale complex, 12 to 17 percent slopes (SxE).--This complex is on side slopes that are dissected by short drainageways and on narrow ridgetops. The individual soils of this complex occur in an intricate pattern, and in any given area different kinds of soils may occur within a short distance. Susquehanna and related soils make up the major part of the complex, and Benndale soils make up about 13 percent.

The Susquehanna soils generally are on the lower slopes and extend to the middle slopes. The Benndale soils generally occur on the upper slopes and on narrow ridgetops between drainageways. The two dominant soils and one or more minor soils occur in any given area.

The somewhat poorly drained Susquehanna soils have a surface layer of dark grayish-brown fine sandy loam, about 4 inches thick, over mottled red, yellow, and gray clay that extends to a depth of about 70 inches. The Susquehanna soils are strongly acid. The available water capacity is moderate. Permeability is slow, and runoff is rapid.

The well-drained Benndale soils have a dark grayish-brown surface layer about 4 inches thick underlain, to a depth of about 68 inches, by yellowish-brown sandy loam or loam. The Benndale soils are very strongly acid. The available water capacity is moderate. Permeability is moderate, and runoff is rapid.

Nearly all of this complex is in pine and hardwood forest. The slope makes it unsuitable for cropland or pasture. Runoff is very rapid, and the hazard of erosion is severe. Pine trees are suited. (Capability unit VIIe-1; woodland group: Susquehanna part 3c2, Benndale part 2o1; woodland forage site 1; wildlife group 2)

This section contains information about the use and management of the soils of George County for crops and pasture, woodland, engineering, town and country planning, and wildlife. It explains the system of capability classification used by the Soil Conservation Service and gives estimated yields of the principal crops grown in the county under a high level of management.

This section also groups the soils according to their suitability for woodland forage sites and for wildlife groups. It contains a table that gives ratings of the soils for town and country planning and a subsection that gives information about soils significant in engineering. Information about management is given in the section "Descriptions of the Soils."

Management of the Soils for Cultivated Crops and Pasture

This section discusses management of the soils for cultivated crops and for pasture and hayland.

Cultivation of the soils reduces the organic-matter content, speeds up the leaching of plant nutrients, and increases the hazard of erosion. Cropping systems that include crops that produce much residue are needed to maintain the organic-matter content, increase fertility, and control erosion.

A soil-improving cropping system includes sod crops or annual close-growing crops grown in sequence with row crops. This kind of cropping system in combination with suitable mechanical practices, such as plowing on the contour (see pl. I), terracing, and grassed waterways, helps to maintain the organic-matter content, preserve fertility, and control erosion. The amount of time required for cultivation in proportion to that required for close-growing crops depends on the soil type and the degree of slope.

Chemical fertilizer and lime are needed on most soils in George County, but these should be added according to the results of soil tests. Information is available through the Agricultural Extension Service and the Mississippi Agricultural Experiment Station.

Crop residue should be shredded and left on the surface or disked into the plow layer. On soils subject to flooding, the residue should be left standing until flooding is no longer a hazard or until time for preparation for the next crops.

Erosion is the main hazard on sloping soils, such as Benndale fine sandy loam, 5 to 8 percent slopes, and McLaurin fine sandy loam, 5 to 8 percent slopes. Terraces, stripcropping, plowing on the contour, and grassed waterways are needed for control of erosion on such soils.

Surface and internal drainage are problems on some soils of the county. Main and lateral drainage ditches and surface field drains are needed. In some areas diversions are needed to protect flat land adjacent to uplands.

Good cover of suitable grasses and legumes protects the soil from erosion, maintains the organic-matter content, and provides forage and feed for livestock.

The soils of this county are suited to a wide variety of grasses and legumes. Suitable perennial grasses include bahiagrass (see pl. II), common and Coastal bermudagrass, and tall fescue. Among the suitable legumes are white clover, arrowleaf, crimson clover, ball clover, common lespedeza, and sericea lespedeza.

Regular additions of fertilizer and lime improve the quality and increase yields. Proper stocking rates should be observed to maintain productivity of the pastures.

Capability Grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The soils are grouped according to their limitations when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or for engineering.

In the capability system, the kinds of soils are grouped at three levels: the capability class, the subclass, and the unit (5). These are discussed 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.

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 too cold or too dry. The c subclass is not used in George County.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by w, s, and c, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife habitat, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils.

Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-1 or IVs-2. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

The capability units of George County are not numbered consecutively, because they fit into a statewide system of capability classification and not all the capability units of this system are represented in this county. The capability unit designation for each soil in the county can be found in the "Guide to Mapping Units."

The eight classes in the capability system and the subclasses and units in George County are described in the list that follows.

Class I. Soils that have few limitations that restrict their use.
- Unit I-1. Well-drained soils; 0 to 2 percent slopes.

Class II. Soils that have moderate limitations that reduce the choice of plants or that require moderate conservation practices.
- Subclass IIe. Soils subject to moderate erosion if they are not protected.
  - Unit IIe-1. Well-drained soils; 2 to 5 percent slopes.
  - Unit IIe-2. Moderately well drained soils; 2 to 5 percent slopes.
- Subclass IIw. Soils that have moderate limitations because of excess water.
  - Unit IIw-1. Moderately well drained, moderately permeable soils; 0 to 2 percent slopes.
  - Unit IIw-2. Moderately well drained, slowly permeable, clayey soils; 0 to 2 percent slopes.
- Subclass IIs. Soils that have moderate limitations of available water capacity or tilth.
  - Unit IIs-1. Slightly droughty soils; 0 to 2 percent slopes.

Class III. Soils that have severe limitations that reduce the choice of plants, require special conservation practices, or both.
- Subclass IIIe. Soils subject to severe erosion if they are cultivated and not protected.
  - Unit IIIe-1. Well-drained soils; 5 to 12 percent slopes.
- Subclass IIIw. Soils that have severe limitations because of excess water.
  - Unit IIIw-1. Somewhat poorly drained soils; 0 to 2 percent slopes.
- Subclass IIIs. Soils that have severe limitations because of low available water capacity or tilth.
  - Unit IIIs-1. Somewhat excessively drained soils; 0 to 5 percent slopes.

Class IV. Soils that have very severe limitations that reduce the choice of plants, require careful management, or both.
- Subclass IVe. Soils subject to severe erosion if they are cultivated and not protected.
  - Unit IVe-1. Well-drained soils; 8 to 12 percent slopes.
  - Unit IVe-2. Somewhat poorly drained soils; 2 to 5 percent slopes.
- Subclass IVw. Soils that have very severe limitations for cultivation because of excess water.
  - Unit IVw-1. Poorly drained soils; 0 to 2 percent slopes.
- Subclass IVs. Soils that have very severe limitations because of low available water capacity or other soil feature.
  - Unit IVs-1. Somewhat excessively drained soils; 5 to 8 percent slopes.
  - Unit IVs-2. Excessively drained soils; 0 to 5 percent slopes.

Class V. Soils that are not likely to erode but have other limitations, impractical to remove, that limit their use to pasture, range, woodland, or wildlife habitat. (None of the soils in George County have been placed in Class V.)

Class VI. Soils that have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife habitat.
- Subclass VIe. Soils severely limited, chiefly by risk of erosion, if protective cover is not maintained.
  - Unit VIe-1. Well-drained soils; 12 to 17 percent slopes.
  - Unit VIe-2. somewhat poorly drained soils; 5 to 12 percent slopes.
- Subclass VIs. Soils generally unsuited to cultivation and limited for other uses by their available water capacity or tilth.
  - Unit VIs-1. Somewhat excessively drained soils; 5 to 12 percent slopes.

Class VII. Soils that have very severe limitations that make them generally unsuited to cultivation and restrict their use largely to pasture, woodland, or wildlife habitat.
- Subclass VIIe. Soils very severely limited, chiefly by risk of erosion, if protective cover is not maintained.

Bahiagrass hay. The soil is McLaurin fine sandy loam, 5 to 8 percent slopes, in capability unit IIIe-1.

Longleaf pine after thinning. The soil is McLaurin fine sandy loam, 2 to 5 percent slopes, in woodland group 20.

Farm pond constructed to supply water for livestock and for recreation.

Unit VIIe-1. Somewhat poorly drained soils; 12 to 17 percent slopes.

Subclass VIIw. Soils that have very severe limitations because of excess water.

Unit VIIw-1. Very poorly drained soils on flood plains.

Subclass VIIs. Soils very severely limited by available water capacity, stones, or other features.

Unit VIIs-1. Somewhat excessively drained, sandy soils; 12 to 20 percent slopes.

Unit VIIs-2. Excessively drained soils; 5 to 17 percent slopes.

Class VIII. Soils and landforms that have limitations that preclude their use for commercial production of plants and restrict their use to recreation, wildlife habitat, or water supply, or to esthetic purposes. (None of the soils in George County have been placed in Class VIII.)

Estimated Yields

Estimates of yields of principal crops grown in George County under a high level of management are shown in table 3. The estimates are based on yields obtained under long-term experiments, yields obtained on farms where there was participation in soil management studies, and field trials and demonstration plots on which yields were measured. Soils for which data from these sources were lacking were compared with similar soils. The estimates are for nonirrigated areas. The data reflect average rainfall, temperature, and climatic factors that influence yields.

To obtain yields similar to those shown in table 3, the following management practices are recommended:

1. Fertilizing at planting time in amounts indicated by soil tests, by past experience with cropping and fertilizing practices, and by recommendations of the Mississippi Agricultural Experiment Station for this area.
2. Using crop varieties and hybrids that produce high yields and are suited to the area.
3. Preparing the seedbed adequately.
4. Planting by suitable methods at the proper time and seeding rate.
5. Inoculating legumes.
6. Practicing shallow cultivation of row crops.
7. Controlling weeds, insects, and diseases.
8. Using conservation cropping systems similar to those discussed in the series descriptions.
9. Where needed, establishing grassed waterways, cultivating on the contour, terracing, contour stripcropping, and using diversion terraces.
10. Protecting pastures from overgrazing.

Use of the Soils for Woodland [2/]

According to the Mississippi Forest Survey (11), 251,500 acres, or about 82 percent of the land area of George County, was in woodland in 1957. Forest is the largest single natural resource within the county. A considerable acreage is used for grazing.

Logging and lumbering was the first large industry in the county. Today, raw and finished forest products are the base of the economy of the county.

Forest types generally are given the name of the tree or trees that are dominant in the stands. In George County there are three broad major types: the longleaf-slash pine type on the uplands (see pl. II), the loblolly-shortleaf pine type on the broad terraces of the Pascagoula River, and the oak-gum-cypress type on the flood plain of the Pascagoula River, Black Creek, and Red Creek.

Rating of soils for woodland in George County has been made on the basis of performance of the soils when used for the production of wood crops. Ratings are based on research, on measurements made by foresters and soil scientists, and on the experience of forest landowners.

Potential productivity is expressed in table 4 as a site index for species on which information is available. Site index is the average height, in feet, of free-growing dominant trees 50 years of age.

Potential yield is an expression in board feet (Doyle scale) and cords that soils in a given woodland group will produce per year under management.

Preferred species is shown by listing the principal commercial trees to favor in existing stands. The basis for selection of preferred species was mainly their growth rate, quality, value, and general marketability. Many other species occur and should be managed on the basis of quality of the individual tree or stands.

Hazards and limitations that affect management on each woodland group were rated in relative terms. These are expressed as slight, moderate, and severe. Only those hazards and limitations that are moderate or severe are discussed.

Seedling mortality is the expected mortality, from soil-related causes, of preferred tree seedlings that are planted, direct seeded, or naturally seeded. Mortality is slight if no more than 25 percent of the seedlings die, it is moderate if 25 to 50 percent die, and it is severe if more than 50 percent die.

Erosion hazard is based on the erodibility of the particular soil and the slope. The ratings are slight, moderate, and severe.

Equipment limitations were rated on the basis of soil characteristics and topographic features that

2/ ROBERT L. GRIGSBY, woodland conservationist, Soil Conservation Service, assisted in the preparation of this section.

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TABLE 3.--ESTIMATED AVERAGE YIELDS PER ACRE OF THE PRINCIPAL CROPS UNDER A HIGH LEVEL OF MANAGEMENT

[The estimates are within a range of ± 10 percent. Absence of figure indicates that the crop is not commonly grown on the particular soil or that there are no data on which to base an estimate]

Soil	Corn	Soybeans	Oats	Pasture			Hay	
				Bahiagrass	Coastal bermudagrass	Tall fescue and clover	Bahiagrass	Coastal bermudagrass
	Bu.	Bu.	Bu.	A.U.M. 1/	A.U.M. 1/	A.U.M. 1/	Tons	Tons
Alaga loamy sand, 0 to 5 percent slopes	45	15	45	3.8	6.0	---	2.5	2.5
Alaga loamy sand, 5 to 8 percent slopes	37	13	35	3.4	4.5	---	2.0	2.0
Alaga loamy sand, 8 to 12 percent slopes	--	--	--	3.0	3.0	---	2.0	2.0
Alaga loamy sand, terrace, 0 to 5 percent slopes	45	15	45	4.0	6.2	---	2.7	2.7
Alaga complex, 12 to 20 percent slopes	--	--	--	---	---	---	---	---
Angie silt loam, 0 to 2 percent slopes	50	25	50	7.0	9.0	4.7	4.3	4.3
Atmore fine sandy loam, 0 to 2 percent slopes	--	--	--	6.5	7.0	6.0	---	---
Basin fine sandy loam, 0 to 2 percent slopes	70	35	65	7.0	9.0	---	4.2	4.2
Benndale fine sandy loam, 0 to 2 percent slopes	65	30	60	9.0	11.0	5.2	5.2	5.5
Benndale fine sandy loam, 2 to 5 percent slopes	65	28	60	8.5	10.5	5.0	4.7	5.0
Benndale fine sandy loam, 5 to 8 percent slopes	60	25	55	8.0	9.0	---	4.2	4.5
Benndale complex, 2 to 5 percent slopes	--	--	--	---	---	---	---	---
Benndale complex, 5 to 12 percent slopes	--	--	--	---	---	---	---	---
Cahaba fine sandy loam, 0 to 2 percent slopes	65	22	--	6.3	8.3	4.5	3.8	3.8
Cahaba fine sandy loam, 12 to 17 percent slopes	--	--	--	5.5	6.5	---	---	---
Dorovan-Johnston association	--	--	--	---	---	---	---	---
Eustis loamy sand, 0 to 5 percent slopes	55	15	45	3.5	5.0	---	4.8	4.8
Eustis loamy sand, 5 to 12 percent slopes	--	--	--	3.4	3.8	3.8	---	3.0
Eustis loamy sand, 12 to 20 percent slopes	--	--	--	---	---	---	---	---
Harleston fine sandy loam, 0 to 2 percent slopes	75	35	65	7.0	9.0	6.2	4.5	4.5
Harleston fine sandy loam, 2 to 5 percent slopes	70	35	60	7.0	9.0	6.2	4.0	4.0
Lakeland sand, 0 to 5 percent slopes	--	--	--	---	---	---	---	---
Lakeland sand, 5 to 17 percent slopes	--	--	--	---	---	---	---	---
Leaf-Lenoir association	--	--	--	---	---	---	---	---
Lenoir silt loam	45	--	--	6.0	---	6.3	---	---
Lucedale sandy loam, 0 to 2 percent slopes	70	32	65	9.0	10.5	7.0	5.0	5.0

TABLE 3.--ESTIMATED AVERAGE YIELDS PER ACRE OF THE PRINCIPAL CROPS UNDER A HIGH LEVEL OF MANAGEMENT--Cont.

Soil	Corn	Soybeans	Oats	Pasture			Hay	
				Bahiagrass	Coastal bermudagrass	Tall fescue and clover	Bahiagrass	Coastal bermudagrass
	Bu.	Bu.	Bu.	A.U.M. 1/	A.U.M. 1/	A.U.M. 1/	Tons	Tons
Lucedale sandy loam, 2 to 5 percent slopes	66	31	64	8.7	10.5	7.0	5.0	5.0
McLaurin fine sandy loam, 0 to 2 percent slopes	65	28	60	9.0	11.0	5.5	5.0	5.0
McLaurin fine sandy loam, 2 to 5 percent slopes	60	26	55	8.0	10.5	5.0	4.7	4.7
McLaurin fine sandy loam, 5 to 8 percent slopes	55	23	55	7.0	9.0	6.0	4.5	4.5
McLaurin fine sandy loam, 8 to 12 percent slopes	45	--	--	6.5	8.3	---	4.0	4.0
Myatt silt loam, 0 to 2 percent slopes	--	--	--	---	---	---	---	---
Rumford sandy loam, 0 to 2 percent slopes	55	25	55	8.0	10.0	5.0	4.5	4.5
Susquehanna fine sandy loam, 2 to 5 percent slopes	--	--	--	4.0	5.5	2.5	---	---
Susquehanna fine sandy loam, 5 to 8 percent slopes	--	--	--	4.0	5.5	2.5	---	---
Susquehanna fine sandy loam, 8 to 12 percent slopes	--	--	--	4.0	5.5	2.5	---	---
Susquehanna complex, 2 to 5 percent slopes	--	--	--	---	---	---	---	---
Susquehanna complex, 5 to 12 percent slopes	--	--	--	---	---	---	---	---
Susquehanna complex, 12 to 17 percent slopes	--	--	--	---	---	---	---	---
Susquehanna-Benndale complex, 12 to 17 percent slopes	--	--	--	---	---	---	---	---

1/ Animal-unit-month is a term used to express the carrying capacity of a pasture. It is the number of months that 1 acre will provide grazing for one animal unit (1,000 pounds live weight).

restrict the time, method, or equipment used in routine logging. Some factors are slope, wetness, texture of the surface soil, and duration of flooding. The limitation is slight if equipment can be used at any time of the year except during short periods of heavy rainfall. It is moderate if equipment is restricted for 1 to 3 months by soil wetness or flooding. The limitation is severe if use of equipment is restricted by water for more than 3 months during an otherwise normal year.

Plant competition refers to the invasion or growth of undesirable woody species or heavy grass when openings are made in the crown cover by intermediate cuttings or harvest cuttings for regeneration of the stand. Competition is slight if it does not prevent adequate regeneration. It is moderate if it delays regeneration but does not prevent the eventual development of fully stocked stands. It is severe if it prevents adequate regeneration without intensive site preparation and maintenance.

Woodland Groups

The soils of George County have been placed in woodland groups to assist owners of woodland in planning the use of their soils for wood crops. Each group is made up of soils that are suited to the same kinds of trees, that need approximately the same kind of management when vegetation on them is similar, and that have about the same potential productivity. The woodland classification of each individual soil is given in the "Guide to Mapping Units."

Each woodland group is identified by a three-part symbol, such as 1w9, 2o1, or 3s2.

The first element of the group symbol indicates the woodland suitability class. It expresses site quality by an Arabic numeral ranging from 1 to 5; soils in class 1 have the highest potential productivity. Site quality is based on the average site index of one or more indicator forest types, or tree species, as shown in table 4.

The second element of the symbol indicates the suitability subclass. It expresses selected soil properties that cause a moderate to severe hazard or limitation in woodland use or management. It is indicated by one of the following:

Subclass w (excessive wetness). Soils in which excessive water, either seasonally or the year around, causes significant limitations for woodland use or management. These soils have restricted drainage, a high water table, or a flooding hazard that adversely affects stand development or management.

Subclass c (clayey soils). Soils that have restrictions or limitations for woodland use or management because of the kind or amount of clay in the upper part of the profile.

Subclass s (sandy soils). Sandy soils that have little or no textural B horizon and have moderate to severe restrictions or limitations for woodland use or management. These soils have limitations for use of equipment, have low available water capacity, and normally are low in available plant nutrients.

Subclass o (slight or no limitations). Soils that have no significant restrictions or limitations for woodland use or management. Some kinds of soil may have more than one set of subclass characteristics. Priority in placing each kind of soil into a subclass is in the order that the subclass characteristics are listed above.

The third element in the symbol indicates the severity of the hazard or the degree of the limitation, and the general suitability of the soils for certain kinds of trees. The three management problems considered here are erosion hazard, equipment limitations, and seedling mortality.

The numeral 1 indicates soils that have slight management problems or none and are well suited to needleleaf trees.

The numeral 2 indicates soils that have one or more moderate management problems and are well suited to needleleaf trees.

The numeral 3 indicates soils that have one or more severe management problems and are well suited to needleleaf trees.

The numeral 7 indicates soils that have slight management problems or none and are suited to either needleleaf or broadleaf trees.

The numeral 8 indicates soils that have one or more moderate management problems and are suited to either needleleaf or broadleaf trees.

The numeral 9 indicates soils that have one or more severe management problems and are suited to either needleleaf or broadleaf trees.

Use of the Soils for Woodland Grazing[3/]

The woodland of George County is used primarily for the production of timber, but it also supplies significant amounts of forage that can be moderately grazed without appreciable damage to the timber. More than half of the woodland of the county, or about 150,000 acres, is grazed, either seasonally or throughout the year.

The production of woodland forage depends mostly on the soil, the kinds of plants grown, the amount of shade (the density of the timber canopy), and the amount of rainfall. The soils of George County are capable of producing different kinds and amounts of grazable forage. To better manage woodland forage, the operator needs to know the soils and the plants each soil is capable of growing. The concept of the woodland forage site expresses these differences in productive capacity.

Woodland Forage Sites

The soils of George County have been grouped in three woodland forage sites. A woodland forage site

3/ DAVID W. SANDERS, range conservationist, helped prepare this section.

TABLE 4.--WOODLAND GROUPS OF SOILS

Woodland groups and mapping symbols	Potential productivity		Preferred species	Hazards and limitations
	Species	Site index		
Group 1w9: Very poorly drained, highly productive soils on flood plains (Dh).	Loblolly pine---	95+	Green ash, baldcypress, southern magnolia, red maple, loblolly pine, sweetgum, water tupelo, and yellow-poplar.	Excess water is the major hazard. This group includes organic soils that are wet throughout the year. Seedling mortality and equipment limitations are severe, except in areas that have adequate surface drainage. Logging and woods operations are restricted to dry periods.
Group 2o1: Well-drained, highly productive soils on uplands (BeA, BeB, BeC, BnB, BnC, CaE, LuA, LuB, M1A, M1B, M1C, M1D).	Loblolly pine--- Slash pine------ Longleaf pine---	85-95 85-95 70-90	Loblolly pine, longleaf pine, and slash pine.	Equipment limitations and the erosion hazard are moderate on slopes of more than 12 percent. In places seedlings and saplings of preferred species need to be released from competing hardwoods.
Group 2w9: Dominantly poorly drained, highly productive, loamy and clayey soils (Lf, MyA).	Loblolly pine--- Sweetgum--------	85-95 85-95	Green ash, baldcypress, Shumard oak, swamp chestnut oak, water oak, white oak, loblolly pine, slash pine, sweetgum, and water tupelo.	Excess water is the major hazard. Plant competition and equipment limitations are severe. Seedling mortality is severe, except in areas that have adequate surface drainage.
Group 3w9: Wet, highly productive soils (AtA).	Loblolly pine--- Sweetgum--------	75-85 75-85	Loblolly pine, sweetgum, white oak, water oak, and red oak.	Equipment limitations and seedling mortality are severe, except in areas that have adequate surface drainage.
Group 2o7: Well-drained, highly productive, loamy soils (CaA, RuA).	Loblolly pine--- Slash pine------ Longleaf pine---	85-95 85-95 80-90	Loblolly pine, longleaf pine, slash pine, sycamore, sweetgum, red oak, and white oak.	Equipment limitations and the erosion hazard are slight. In places seedlings and saplings of preferred species need to be released from competing hardwoods of undesirable species.
Group 2w8: Somewhat poorly drained to moderately well drained, highly productive soils (AnA, BaA, HaA, HaB, Ln).	Loblolly pine--- Slash pine------ Longleaf pine---	85-95 85-95 70-80	Cherrybark oak, Shumard oak, loblolly pine, longleaf pine, slash pine, sweetgum, black tupelo, and yellow-poplar.	Seedling mortality and equipment limitations are slight to moderate. Growth of commercial hardwoods is restricted to most areas.

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TABLE 4.--WOODLAND GROUPS OF SOILS--Continued

Woodland groups and mapping symbols	Potential productivity		Preferred species	Hazards and limitations
	Species	Site index		
Group 3s2: Somewhat excessively drained, moderately highly productive loamy sands on uplands (AgB, AgC, AgD, AmE, EsB, EsD, EsE).	Loblolly pine--- Longleaf pine---	75-85 75-85	Loblolly pine, longleaf pine, slash pine, and shortleaf pine.	Drought is the major hazard. Seedling mortality is moderate, and equipment limitations are slight to moderate.
Group 2s2: Somewhat excessively drained, highly productive loamy sands that have good recharge of water because of fluctuation of ground water; on terraces (AlB).	Loblolly pine--- Slash pine------ Longleaf pine---	85-90 85-90 75-85	Loblolly pine, longleaf pine, slash pine, and shortleaf pine.	Seedling mortality and equipment limitations are slight to moderate.
Group 3c2: Somewhat poorly drained, moderately highly productive soils that are clayey below the surface layer; on uplands (SnB, SnC, SnD, SuB, SuD, SuE, SxE). (For Benndale part of SxE, see woodland group 2o1)	Loblolly pine--- Longleaf pine--- Slash pine------	75-85 65-75 75-85	Loblolly pine, longleaf pine, slash pine, and shortleaf pine.	Equipment limitations are moderate on slopes of more than 15 percent. Seedling mortality is moderate.
Group 4s3: Excessively drained, moderately productive sands; on uplands (LeB, LeE).	Loblolly pine--- Longleaf pine---	65-75 60-70	Loblolly pine, longleaf pine, slash pine, and shortleaf pine.	These soils are extremely droughty. Seedling mortality is severe. Because of the unstable condition of these sandy soils during dry summers, logging operations should be planned for wet periods.

is made up of soils that differ from the soils of other sites, that produce significantly different kinds and amounts of native vegetation, and that require different management to maintain or improve the site.

The three woodland forage sites in this county are described in the following pages. To learn the names of the soils in these sites, refer to the "Guide to Mapping Units."

In describing the woodland forage sites, the terms forage condition, timber canopy, and decreaser, increaser, and invader are used.

Forage condition is a term used to compare the present native vegetation with the potential vegetation for the site. Forage condition is divided into four classes. These classes measure the degree to which the present composition, in terms of percentage, has changed from that of the potential.

Plant composition is determined by estimates of the relative production, by weight, of the species that make up the potential plant community of the forage site. The site is in excellent condition if 76 to 100 percent of the plant composition is the potential for the site. It is in good condition if 51 to 75 percent is the potential, in fair condition if 26 to 50 percent is the potential, and in poor condition if 0 to 25 percent is the potential.

The timber canopy is classified according to the amount of shade it gives at midday. The canopy is dense if it shades 56 to 70 percent of the ground, medium if it shades 36 to 55 percent, sparse if it shades 21 to 35 percent, and open if it shades 0 to 20 percent.

To facilitate determining forage condition, the components of the vegetation are grouped according to their response to the kind of grazing use on specific forage sites. The component categories are decreaser, increaser, and invader plants. Decreaser plants are species in the potential plant community that decrease in relative abundance when subjected to continued excessive grazing during the growing season. Increaser plants are species that increase in relative abundance when subjected to continued excessive grazing. These plants normally decrease, however, under prolonged grazing pressure. Invader plants are not members of the potential plant community. They come in as the more desirable plants are depleted as a result of continued excessive use, indiscriminate burning, or other adverse management practices. Invaders have little or no forage value.

Woodland Forage Site 1 (Coastal Plain Hills)

The soils of this forage site are somewhat poorly drained to well drained. They have a surface layer of fine sandy loam, silt loam, or sandy loam. The underlying layers range from sandy loam to clay. The slope ranges from 0 to 17 percent.

The soils are strongly acid to very strongly acid. Permeability is rapid to very slow, and the available water capacity is moderate to high. Runoff is slow to medium, and there is little or no hazard of erosion. The rooting depth is adequate for most upland plants.

This site supports good stands of pine, but in some areas the pines are mixed with hardwoods. Except on deep soils along drainageways and on low terraces, the hardwoods tend to be scrubby, squatty, and of poor quality.

The overstory in the plant community consists of longleaf pine, slash pine, loblolly pine, and shortleaf pine. Southern red oak, blackjack oak, water oak, post oak, sweetgum, sweetbay, and hickory are in some pine forests.

The understory shrubs consist chiefly of gallberry, waxmyrtle, yaupon, American beautyberry, and plants that have become wild after having been in cultivation.

The principal forage plants are pinehill bluestem, switchgrass, lopsided indiangrass, and longleaf uniola. These grasses make up about 80 percent of the total forage. Pinehill bluestem is the most common species. Other forage plants are slender bluestem, low panicum, dropseed, perennial three-awn, and grassleaf goldaster.

Brush, annual weeds and grasses, carpetgrass, and broomsedge bluestem are characteristic of forage sites in poor condition.

If this site is in excellent condition, the annual production of forage, air-dry weight, is about 2,500 to 3,000 pounds per acre in areas that have no overstory. In years of low rainfall, the production is about 1,500 to 1,600 pounds per acre.

Woodland Forage Site 2 (Coastal Plain Sand Hills)

The soils of this forage site are somewhat excessively drained to excessively drained. They are loamy sand or sand throughout the profile. The slope ranges from 0 to 20 percent.

The soils are strongly acid or very strongly acid. Permeability is rapid to moderately rapid. The available water capacity is low. Runoff is slow, and erosion is not a serious hazard.

The overstory in the plant community consists of longleaf pine, loblolly pine, and shortleaf pine. Turkey oak, blackjack oak, bluejack oak, post oak, laurel oak, willow oak, and southern red oak are in some pine forests. These hardwoods, however, are generally scrubby, squatty, and of poor quality.

The understory shrubs consist of blueberry species, waxmyrtle, and scrub palmetto.

The principal forage plants are pinehill bluestem, lopsided indiangrass, and perennial tickclover. These grasses make up about 76 percent of the total forage. Other forage plants are slender bluestem, perennial three-awn, dropseed, and low panicum.

Brush, weeds, and broomsedge bluestem are characteristic of forage sites in poor condition.

If this site is in excellent condition, the annual production of forage, air-dry weight, is about 1,800 to 2,000 pounds per acre in areas that have no understory. In years of low rainfall, the production is about 1,300 to 1,400 pounds per acre.

Woodland Forage Site 3 (Coastal Plain Wetlands)

The soils of this forage site are very poorly drained to somewhat poorly drained. They have a surface layer of fine sandy loam, silt loam, or muck. The underlying layers range from muck to clay.

The soils are strongly acid to very strongly acid. Permeability is moderate to very slow. The available water capacity is moderate to high. Runoff is slow, and erosion is not a serious hazard.

The overstory in the plant community consists chiefly of slash pine and loblolly pine. Other trees that grow on this site include sweetbay, sweetgum, black tupelo, water oak, red maple, and cypress.

The understory shrubs consist of waxmyrtle, gallberry, redbay, blueberry, and common buttonbush.

The principal forage plants are pinehill bluestem, switchgrass, toothachegrass, and maidencane. These grasses make up about 70 percent of the forage. Pinehill bluestem and switchgrass are the most common species. Other forage plants are slender bluestem, Elliott bluestem, low panicum, beaked panicum, perennial three-awn, cutover muhly, and sedges and rushes.

Carpetgrass, broomsedge bluestem, and annual grasses and weeds are characteristic of forage sites in poor condition.

If this site is in excellent condition, the annual production of forage, air-dry weight, is about 3,300 pounds per acre in areas that have a sparse canopy.

Engineering Uses of the Soils[4/]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, pipelines, building foundations, facilities for water storage, erosion control structures, drainage systems, and sewage disposal systems. Among the properties most important to the engineer are permeability to water, shear strength, ease or difficulty of compaction, soil drainage, shrink-swell potential, grain size, plasticity, and reaction (pH). Topography and depth to the water table are also important.

Information in this soil survey can be used to--

1. Make soil and land use studies that will aid in selecting and developing sites for industrial, commercial, residential, and recreational uses.
2. Make preliminary estimates of the engineering properties of soils in the planning of agricultural drainage systems, farm ponds, irrigation systems, and diversion terraces.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting locations for highways, airports, pipelines, and cables, and in planning detailed investigations at the selected locations.
4. Locate probable sources of sand and other construction materials.
5. Correlate performance of engineering structures with soil mapping units so as to develop information for overall planning that will be useful in designing and maintaining engineering practices and structures.
6. Determine the suitability of soils for cross-country movement of vehicles and construction equipment.
7. Supplement the information obtained from other published maps, reports, and aerial photographs for the purpose of preparing maps and reports that can be used readily by engineers.
8. Develop other preliminary estimates for construction purposes pertinent to the area.

With the use of the soil map for identification, the engineering interpretations reported here can be useful for many purposes. It should be emphasized that they do not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads or excavations deeper than the depths of layers reported here. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that might be expected.

Some of the terms used in this publication have a special meaning to soil scientists and a different meaning to engineers. The Glossary defines many such terms as they are used in soil science.

Much of the information in this section is given in tables 5, 6, and 7. Table 5 gives estimates of physical and chemical properties of the soils. Table 6 gives interpretations of the soils for various engineering uses, and table 7, engineering test data.

Engineering Classification Systems

Most highway engineers classify soil materials according to the system used by the American Association of State Highway Officials (AASHO) (1, 7). In this system soil materials are classified into seven principal groups, designated A-1 through A-7. The best materials for engineering purposes (gravelly soils of high bearing capacity) are classified as A-1, and the poorest (clayey soils having low strength when wet) are classified as A-7. Within each group, the relative engineering value of the soils is indicated by a group index number. Group indexes range from 0 for the best material to 20 for the poorest. The group indexes for the soils that have been analyzed are given in parentheses following the group number.

Some engineers prefer the Unified classification system (13), which was developed by the Department of Defense. In this system, soil materials are identified as coarse grained (eight classes), fine

4/ PAUL A. CALHOUN, agricultural engineer, Soil Conservation Service, assisted in the preparation of this section.

grained (six classes), or highly organic. Symbols are used to identify each group (7).

The U.S. Department of Agriculture system of classifying soils according to texture is primarily for agricultural use, but the textural classification is useful in engineering also. In this system, soils are classified according to the proportional amounts of different sizes of mineral particles. A soil that is 40 percent clay particles, for example, is called clay. Beginning with the largest, the particle sizes are designated as cobblestones, gravel, sand, silt, and clay.

Estimated Engineering Properties

The estimates in table 5 are for the soil material at a depth of less than 7 feet and are not representative of the material in deeper excavations. The depth to bedrock is not given in this table, because bedrock is at such a great depth in George County that it does not interfere with highway and agricultural engineering. None of the soils contain gravel, so no estimate was made on suitability as a source.

Permeability, as used in table 5, relates only to movement of water downward through undisturbed and uncompacted soil. It does not include lateral seepage. The estimates are based on structure and porosity of the soil. Permeability is an important consideration in building foundations, highways, railroad embankments, and highway subgrades because the settlement of structures depends on the rate at which moisture is squeezed from beneath the structure. Permeability is a consideration also in selecting soil material suitable for use as fill and in planning an irrigation system. It determines to a great extent the effectiveness of open ditches, of tile for drainage, and of fields for sewage disposal.

Available water capacity is approximately the amount of capillary water in a soil when it is wet to field capacity.

Reaction is the degree of acidity or alkalinity of a soil expressed as a pH value. A pH value of 7.0 indicates precise neutrality; a higher value indicates alkalinity, and a lower value indicates acidity.

Shrink-swell potential is an indication of the volume change to be expected of the soil material with changes in moisture content. The ratings are based on tests for volume change made on similar soils in adjacent counties or on observations of other properties of the soils. In general, soils classified as CH and A-7 have a high shrink-swell potential. Clean sands and gravel that contain small amounts of nonplastic to slightly plastic fines have a low shrink-swell potential.

Engineering Interpretations

Table 6 gives the suitability of the soils for certain engineering uses and shows soil features and limitations that affect construction of highways and other engineering structures.

Topsoil is needed to maintain vegetation for control of erosion in ditches and on embankments, road shoulders, and cut slopes. The best sources of sand are the Alaga, Eustis, and Lakeland soils. These soils are also good sources of road fill.

Many of the soils in this county have a high water table part of each year. If roads are built on these soils, an embankment is needed to raise the road level above the water table, or a good drainage system should be provided to lower the water table. An embankment is also needed where roads are built in areas of soils subject to flooding. Dorovan, Johnston, Leaf, and Lenoir soils are examples of such soils.

Among the soil features that affect highway location are steep slopes, low traffic-supporting capacity, a high water table, flooding, high shrink-swell potential, and high organic-matter content. Steep soils should be stabilized to prevent erosion. Soils that have a high clay content have low traffic-supporting capacity and a high shrink-swell potential. Susquehanna soils, for example, are not stable under heavy loads. They should be covered with a base course of sand and gravel to prevent pumping action. Soils, such as those of the Johnston series, that are high in organic-matter content should be excavated and backfilled with more stable material.

Farm ponds are used in this county as a source of water for livestock and for recreation (see pl. II). Soils that are impervious to water and have a slow permeability rate are suitable for reservoir areas. Soils that have a high seepage rate are not suitable. The soil material used for embankments of ponds should be impervious to water and have a low shrink-swell potential. Porous soils tend to seep and to cause the embankment to become saturated and unstable. A high shrink-swell potential causes soils to crack when they are dry, and this weakens the embankment.

Under the heading "Agricultural drainage," features are listed that affect subsurface drainage and the practical removal of surface water. Many of the soils in the county do not have a good natural drainage outlet. Others have slow permeability, which makes subsurface drainage difficult.

The effectiveness of irrigation depends largely on infiltration, or the rate the water enters the soil, and the available water capacity, or the amount of water available to plant roots.

Terraces are used to intercept water flowing downslope and to remove it at a rate that does not cause harmful erosion. Soils that have slopes greater than about 8 percent are too steep for terraces. Diversions are used to intercept and move unwanted water from adjacent areas to a suitable outlet. Sandy soils are unstable and erode easily when water is concentrated on them. Soils that have a high clay content and those that are wet are difficult to work. Highly erodible soils require much maintenance of terraces and diversions.

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification		
			Dominant USDA texture	Unified	AASHO
	Inches	Inches			
Alaga: AgB, AgC, AgD, AlB, AmE----	60+ [1/]	0-50	Loamy sand---	SM	A-2
		50-85	Sand---------	SP-SM	A-3 to A-2
Angie: AnA----------	30	0-10	Silt loam----	ML	A-4
		10-23	Clay loam----	ML or CL	A-6
		23-64	Clay---------	CH	A-7
Atmore: AtA----------	0	0-28	Fine sandy loam.	SM, ML	A-4
		28-60	Sandy loam---	SM	A-2 to A-4
Basin: BaA----------	10	0-9	Fine sandy loam.	ML or SM	A-4
		9-25	Loam---------	ML	A-4
		25-60	Loam---------	ML	A-4
Benndale: BeA, BeB, BeC, BnB, BnC.	60+	0-5	Fine sandy loam.	ML or SM	A-4
		5-33	Loam---------	ML	A-4
		33-73	Sandy loam---	SM	A-2 to A-4
Cahaba: CaA, CaE----------	60+	0-7	Fine sandy loam.	SM or ML	A-4
		7-38	Heavy loam---	ML or CL	A-4 to A-6
		38-56	Sandy loam to loamy sand.	SM	A-2 to A-4
Dorovan: Dh----------	0	0-74	Muck---------	Pt	---------
For Johnston part, see Johnston series.		74-108	Sand---------	SP-SM	A-3 to A-2
Eustis: EsB, EsD, EsE----------	60+	0-92	Loamy sand---	SM	A-2
Harleston: HaA, HaB----------	24	0-9	Fine sandy loam.	ML or SM	A-4
		9-74	Loam---------	ML	A-4
Johnston----------	0	0-3	Mucky silt loam.	Pt	A-5
Mapped only with Dorovan soils.		3-60	Sandy loam, very fine sandy loam.	SM	A-2 to A-4
Lakeland: LeB, LeE----------	60+	0-65	Sand---------	SP-SM	A-3 to A-2
Leaf: Lf----------	0	0-5	Silt loam----	ML	A-4
For Lenoir part, see Lenoir series.		5-11	Silty clay loam.	CL	A-6
		11-55	Silty clay---	CL or CH	A-7

See footnote at end of table.

Percentage passing sieve--		Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 10 (2.0 mm.)	No. 200 (0.074 mm.)				
		Inches per hour	Inches per inch of soil	pH	
100	15-30	6.3-20.0	0.05-0.10	5.1-5.5	Low.
100	5-15	6.3-20.0	<0.05	5.1-5.5	Low.
100	70-90	0.63-2.0	0.10-0.13	5.1-5.5	Low.
100	70-80	0.20-0.63	0.15-0.18	5.1-5.5	Moderate.
100	80-90	0.06-0.20	0.18-0.20	5.1-5.5	High.
100	40-55	0.63-2.0	0.10-0.15	4.5-5.0	Low.
100	30-40	0.2-0.63	0.10-0.15	4.5-5.0	Low.
100	40-55	0.63-2.0	0.10-0.15	5.1-5.5	Low.
100	60-75	0.63-2.0	0.15-0.18	5.1-5.5	Low.
100	60-75	0.06-0.20	0.10-0.15	5.1-5.5	Low.
100	40-55	0.63-2.0	0.10-0.15	4.5-5.0	Low.
100	60-75	0.63-2.0	0.15-0.18	4.5-5.0	Low.
100	30-40	0.63-2.0	0.10-0.15	4.5-5.0	Low.
100	40-55	0.63-2.0	0.10-0.15	5.1-5.5	Low.
100	65-80	0.63-2.0	0.15-0.18	5.1-5.5	Low to moderate.
100	15-40	2.0-6.3	0.05-0.15	5.1-5.5	Low.
---	-----	0.63-2.0	>0.20	4.5-5.0	High.
100	5-15	6.3-20.0	0.05-0.08	4.5-5.0	Low.
100	15-30	6.3-20.0	0.05-0.10	5.1-5.5	Low.
100	40-55	0.63-2.0	0.10-0.15	4.5-5.0	Low.
100	60-75	0.63-2.0	0.15-0.18	4.5-5.0	Low.
100	70-90	0.63-2.0	>0.20	5.1-5.5	Low.
100	30-40	0.63-20.0	0.10-0.15	5.1-5.5	Low.
100	5-15	6.3-20.0	<0.05	4.5-5.0	Low.
100	80-90	0.63-2.0	0.20-0.22	5.1-5.5	Low.
100	85-95	0.20-0.63	0.19-0.21	5.1-5.5	Moderate.
100	85-95	0.06-0.20	0.19-0.21	5.1-5.5	Moderate to high.

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification		
			Dominant USDA texture	Unified	AASHO
	Inches	Inches			
Lenoir: Ln	15	0-6	Silt loam	ML	A-4
		6-14	Loam	ML or CL	A-4 to A-6
		14-60	Clay	CL or CH	A-7, A-6
Lucedale: LuA, LuB	60+	0-8	Sandy loam	SM	A-2 to A-4
		8-60	Sandy clay loam, clay loam.	SC or CL	A-2, A-4, A-6
McLaurin: MlA, MlB, MlC, MlD	60+	0-5	Fine sandy loam.	SM or ML	A-4
		5-70	Sandy loam	SM	A-2 to A-4
		70-80	Loamy sand	SM	A-2
Myatt: MyA	0	0-5	Silt loam	ML	A-4
		5-54	Heavy loam	ML or CL	A-6
		54-64	Clay loam	ML or CL	A-6
Rumford: RuA	0	0-16	Sandy loam	SM	A-2 to A-4
		16-42	Sandy loam	SM	A-2 to A-4
		42-65	Sand	SP-SM	A-3 to A-2
Susquehanna: SnB, SnC, SnD, SuB, SuD, SuE, SxE. For Benndale part of SxE, see Benndale series.	20	0-5	Fine sandy loam.	ML or SM	A-4
		5-77	Clay	CH	A-7

1/ Depth is 30 inches for Alaga soil in AlB.

ENGINEERING PROPERTIES--Continued

Percentage passing sieve--		Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 10 (2.0 mm.)	No. 200 (0.074 mm.)	Inches per hour	Inches per inch of soil	pH	
100	70-90	0.63-2.0	0.20-0.22	5.1-5.5	Low.
100	60-75	0.20-0.63	0.15-0.18	5.1-5.5	Moderate.
100	75-95	0.06-0.20	0.14-0.17	5.1-5.5	High.
100	30-40	0.63-2.0	0.10-0.15	5.1-5.5	Low.
100	30-65	0.63-2.0	0.10-0.15	5.1-5.5	Moderate.
100	40-55	0.63-2.0	0.10-0.15	4.5-5.5	Low.
100	30-40	0.63-2.0	0.10-0.15	4.5-5.5	Low.
100	15-30	6.3-20.0	0.05-0.10	4.5-5.5	Low.
100	70-90	0.63-2.0	0.20-0.22	5.1-5.5	Low.
100	65-80	0.20-0.63	0.15-0.18	5.1-5.5	Low to moderate.
100	70-80	0.20-0.63	0.15-0.18	5.1-5.5	Moderate.
100	30-40	2.0-6.3	0.10-0.15	4.5-5.5	Low.
100	30-40	2.0-6.3	0.10-0.15	4.5-5.5	Low.
100	5-15	6.3-20.0	<0.05	4.5-5.5	Low.
100	45-55	0.63-2.0	0.13-0.16	5.1-5.5	Low.
100	75-95	<0.06	0.15-0.20	5.1-5.5	High.

Soil series and map symbols	Suitability as a source of--			Soil features affecting--
	Topsoil	Sand	Road fill	Highway location
Alaga: AgB, AgC, AgD, AlB, AmE.	Poor	Good to fair	Good	Unstable where slope is more than 6 percent.
Angie: AnA	Fair	Poor	Fair to poor	High shrink-swell potential.
Atmore: AtA	Fair to good	Poor	Poor	High water table
Basin: BaA	Good	Poor	Fair	Wetness
Benndale: BeA, BeB, BeC, BnB, BnC.	Good	Poor	Good to fair	Fair to good traffic-supporting capacity.
Cahaba: CaA, CaE	Fair	Poor	Good	Slope is as much as 17 percent in places.
Dorovan: Dh For Johnston part, see Johnston series.	Poor	Poor	Poor	Organic soils; high water table; low traffic-supporting capacity.
Eustis: EsB, EsD, EsE	Poor	Good to fair	Good	Unstable where slope is more than 6 percent.
Harleston: HaA, HaB	Good	Poor	Fair to good	Seasonal high water table at a depth of 24 inches.
Johnston	Poor to fair	Poor	Poor	High organic-matter content; high water table.

Soil features affecting--Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Reservoir area	Embankment				
Excessive seepage.	Rapid permeability; needs binder.	Not needed-------	Low available water capacity.	Rapid permeability.	Low available water capacity; rapid permeability.
Slow permeability.	Fair stability and compaction characteristics; high shrink-swell potential.	Slow permeability.	Slow infiltration rate.	Soil properties favorable.	Slow permeability; moderate to high available water capacity.
Moderately slow permeability.	Moderate piping and erosion hazard.	Low position; poor natural outlets.	Moderate infiltration rate.	High water table.	Moderately slow permeability.
Slow permeability.	Fair strength and stability.	Slow permeability.	Moderate infiltration rate.	Soil properties favorable.	Slow permeability.
Moderate seepage risk.	Moderate strength and slope stability; poor resistance to piping and erosion.	Not needed------	Moderate infiltration rate; moderate available water capacity.	Soil properties favorable.	Moderate available water capacity and permeability.
Seepage in layers at a depth below about 38 inches.	Moderate piping and erosion hazard.	Not needed------	Moderate infiltration rate and available water capacity.	Soil properties favorable.	Erodible where slope is 12 to 17 percent.
High water table.	Poor resistance to piping and erosion.	Poor natural outlets.	Wet most of the year.	Not needed------	Unstable material.
Excessive seepage.	Rapid permeability; needs binder.	Not needed------	Low available water capacity.	Rapid permeability.	Low available water capacity; rapid permeability.
Moderate seepage risk.	Fair slope stability; poor resistance to piping and erosion.	Moderate permeability.	Moderate available water capacity and infiltration rate.	Soil properties favorable.	Moderate permeability and available water capacity.
High water table.	Poor resistance to piping and erosion.	Poor natural outlets.	Wet most of the year.	Not needed------	High water table.

Soil series and map symbols	Suitability as a source of--			Soil features affecting--
	Topsoil	Sand	Road fill	Highway location
Lakeland: LeB, LeE	Poor	Good	Good	Unstable where slope is 5 to 17 percent.
Leaf: Lf For Lenoir part, see Lenoir series.	Fair	Poor	Poor	Wetness; frequent flooding; moderate to high shrink-swell potential.
Lenoir: Ln	Fair	Poor	Poor	Low traffic-supporting capacity; high shrink-swell potential.
Lucedale: LuA, LuB	Fair	Poor	Fair	Moderate shrink-swell potential.
McLaurin: MlA, MlB, MlC, MlD	Good	Poor	Good	Unstable where slope is more than 6 percent.
Myatt: MyA	Fair	Good	Fair	Frequent flooding
Rumford: RuA	Fair	Fair	Good	Occasional flooding
Susquehanna: SnB, SnC, SnD, SuB, SuD, SuE, SxE. For Benndale part of SxE, see Benndale series.	Poor	Poor	Poor	High shrink-swell potential; low strength and stability.

Soil features affecting--Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Reservoir area	Embankment				
Rapid permeability.	Loose, unstable sand; needs binder.	Not needed------	Low available water capacity.	Rapid permeability.	Rapid permeability.
Frequent flooding.	Good to fair resistance to piping and erosion; moderate to high shrink-swell potential.	Slow permeability and poor outlets.	Slow infiltration and permeability rates.	Not needed------	High available water capacity; slow permeability.
Slow permeability.	High shrink-swell potential.	Slow permeability.	Slow infiltration rate and permeability.	Not needed------	Slow permeability.
Moderate seepage risk.	Needs binder to seal.	Not needed------	Moderate infiltration rate.	Soil properties favorable.	Soil properties favorable.
High seepage risk.	Moderate strength and slope stability; poor resistance to piping and erosion.	Not needed------	Moderate infiltration rate.	Soil properties favorable.	Moderate to low available water capacity and moderate permeability.
Low seepage risk; frequent flooding.	Moderate strength and stability.	Frequent flooding; poor natural outlets.	Moderately slow permeability.	Not needed------	Moderately slow permeability.
Seepage--------	Will not seal---	Not needed-----	Rapid infiltration rate.	Not needed-----	Low to moderate available water capacity.
Very slow permeability.	High shrink-swell potential; erodibility.	Very slow permeability.	Very slow infiltration and permeability rates.	Erodibility; difficult to work.	Erodibility; difficult to vegetate.

TABLE 7.--ENGINEERING

[Tests performed by Mississippi State Highway Department in cooperation

Soil name and location	Report No.	Depth	Moisture-density data 1/		Volume change	Shrinkage limit	Shrinkage ratio
			Maximum dry density	Optimum moisture			
		In.					
Lucedale sandy loam:							
SE¼SW¼ sec. 21, T. 3 S., R. 6 W.	538357	0-6	114.9	11.0	---	---	---
	538358	19-34	120.3	11.4	20	12	1.86
	538359	34-70	118.6	13.4	16	13	1.80
McLaurin sandy loam:							
NE¼NW¼ sec. 28, T. 2 S., R. 8 W.	538360	0-8	114.2	11.7	---	---	---
	538361	12-28	119.8	11.0	28	11	1.89
	538362	41-102	122.0	9.7	11	11	1.85

1/ Based on AASHO Designation T 99-57, Method A (1).

2/ Mechanical analysis according to AASHO Designation T 88. Results by this procedure frequently differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for use in naming textural classes for soils.

TEST DATA

with U.S. Department of Transportation, Federal Highway Administration]

Mechanical analysis 2/							Liquid limit	Plastic limit	Plasticity index	Classification	
Percentage passing sieve--			Percentage smaller than--								
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				AASHO 3/	Unified 4/
							Pct.				
100	92	30	25	17	8	5	---	---	(5/)	A-2-4(0)	SM
100	94	39	37	29	19	16	24	18	6	A-4(1)	SM-SC
100	94	31	27	24	18	17	23	19	4	A-2-4(0)	SM-SC
100	89	35	29	20	12	8	---	---	(5/)	A-2-4(0)	SM
100	93	47	39	32	22	20	27	14	13	A-6(3)	SC
100	89	33	26	20	14	11	18	17	1	A-2-4(0)	SM

3/ Based on AASHO Designation M 145-49.

4/ Based on the Unified Soil Classification System (13).

5/ Nonplastic.

Permeability, erodibility, and suitability for permanent vegetation are among the features that affect use of the soils for waterways.

Test Data

Table 7 gives test data for samples of two of the soil series of the county. Selected layers of the soils were sampled, and the samples were tested by the Mississippi State Highway Department according to standard procedures. The samples tested were taken from profiles considered modal for the series. Following are explanations of the headings in table 7.

If a soil material is compacted at successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material will increase until the optimum moisture content is reached. After that, the density decreases as the moisture content increases. The highest dry density obtained in the compaction test is termed maximum dry density, and the corresponding moisture content is the optimum moisture. Moisture-density data are important in earthwork, for, as a rule, soil is most stable if it is compacted to about the maximum dry density at approximately the optimum moisture content.

As moisture leaves a soil, the soil decreases in volume in proportion to the loss in moisture, until a point is reached where shrinkage stops even though additional moisture is removed. The moisture content at which shrinkage stops is called the shrinkage limit. The shrinkage limit of a soil is a general indication of the clay content; it decreases as the clay content increases. In sand that contains little or no clay, the shrinkage limit is close to the liquid limit and is considered insignificant. As a rule, the load-carrying capacity of a soil is at a maximum when its moisture content is at or below the shrinkage limit. Sand does not follow this rule, because if it is confined, its load-carrying capacity is uniform within a considerable range in moisture content.

The shrinkage ratio is the volume change resulting from the drying of a soil material, divided by the loss of moisture caused by drying. The ratio is expressed numerically. The volume change used in computing shrinkage ratio is the change in volume that takes place in a soil when it dries from a given moisture content to a point where no further shrinkage takes place.

In mechanical analysis the soil components are sorted by particle size. Sand and other granular material are retained on a No. 200 sieve, but finer particles pass through the openings. Clay is the fraction smaller than 0.002 millimeter in diameter. The material intermediate in size between that held on the No. 200 sieve and that having a diameter of 0.002 millimeter is mostly silt.

The tests for liquid limit measure the effect of water on the consistence of the soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material passes from a semisolid to a plastic state. The liquid limit is the moisture content at which the material passes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic.

Town and Country Planning

George County is near the densely populated Gulf Coast area. Large tracts of woodland and an abundance of fresh water make the county attractive for outdoor recreation. Fishing and hunting are the principal sports. Many areas of the county are suitable for light industry and other nonfarm uses.

The limitations and hazards that affect the suitability of the soils for town and country planning uses are rated in table 8. The ratings are slight, moderate, and severe. A rating of slight means that the soil has few or no limitations for the use specified or that the limitations can be easily overcome. A rating of moderate indicates that some planning and engineering practices are needed to overcome the limitations. A rating of severe indicates that the soil is poorly suited to the use specified and that intensive engineering practices, as well as a larger investment, are needed to overcome the problems.

Septic tank filter fields.--For the ratings in this column of table 8, only the limitations of the soils for disposal fields for septic tanks were considered. Important characteristics are permeability, rate of percolation, depth to the water table, hazard of flooding, and slope. The soils should be permeable and have good drainage. Flooding should not be a hazard, and the water table should be at a depth below 60 inches most of the year.

Campsites.--A campsite is an area suitable for tenting and for living outdoors for a period of a week or more. The major considerations used in rating the soils for campsites are slope, permeability, wetness, and texture of the surface soil. Little site preparation of the soils should be necessary. The soils should be capable of producing trees and grass to provide an attractive landscape. They should not be naturally wet, and they should be able to support foot traffic.

Picnic areas.--These are areas suitable for outdoor eating facilities. Factors that limit the use of soils for picnic areas are wetness, texture of the surface soil, and slope. The soils should

not be steep, should not be easily eroded, and should withstand heavy foot traffic.

Intensive play areas.--These are areas that can be used for playgrounds and playing fields for organized sports and games. The areas are subject to intensive foot traffic. The major considerations used in rating the soils for intensive play areas are slope, wetness, and surface texture.

Light industry.--This includes buildings other than residences, that are used for stores, offices, and small industries. None of the buildings are more than three stories high. It is assumed that they have public or community sewage systems. If septic tank filter fields are used, column 1 should be used for ratings. The slope, depth to the water table, the hazard of flooding, bearing strength, shrink-swell potential, and corrosion potential are factors considered in making ratings for this use.

Trafficways.--Trafficways are areas that can be developed into roads and trails at low cost. Cuts and fills should be small, and the subgrade should require little preparation. The major considerations in rating limitations of soils used for trafficways are slope, the depth to the water table, the hazard of flooding, erodibility, shrink-swell potential, wetness, and traffic-supporting capacity.

Use of the Soils for Wildlife 5/

The kind of vegetation and the use of the soils determine the kinds and numbers of wildlife that live in an area. Some kinds of wildlife are suited to woodland, some to marshland, and some to farmland, but most species need a combination of these. The kinds of soil in an area affect the kinds and abundance of vegetation, and thus, the habitat for wildlife. Also, the quality and quantity of water and its ability to support fish depend on the kind of soil and plant life and the land use associated with it.

As land-use patterns change, the kinds and numbers of wild animals can be expected to change. In the early days of settlement, when timber covered practically all of the county, turkeys, deer, and squirrels were abundant. Streams, undisturbed by silt from broken ground, produced good fish populations. Natural lakes and marshes along the Pascagoula River and other streams supported waterfowl and furbearers. As the forests were cleared for farming, such farm game species as bobwhite quail, rabbits, and doves, as well as many kinds of songbirds increased in numbers. Deer and turkeys left the area.

Recent trends in land use have continued to affect the kinds and numbers of wildlife. Areas formerly cleared have reverted to trees, and now about 82 percent of the county is woodland. Reforestation, protection, and better management of timber have improved the habitat and brought back many woodland animals. Turkey and deer probably are as numerous now as in pioneer days. Birds and farm game animals, however, have decreased in number. The trend back to woodland has kept the streams and natural lakes in a reasonably clean and productive condition.

Habitat Needs of Game and Fish

Bobwhite quail.--These birds need open and semi-open areas where food is available near vegetation that provides protection from predators and adverse weather. Such conditions exist primarily in areas of row-crop farming. Choice foods for quail are acorns, beechnuts, blackberries, browntop and Texas millet, black cherries, corn, cowpeas, flowering dogwood, mulberries, pine seeds, partridgepeas, ragweed, sweetgum seeds, tickclover (beggarticks), and bicolor, Kobe, Korean, and common lespedeza. Quail also eat insects in warm seasons.

Deer.--Deer require wooded areas, 500 acres or more in size, and a good supply of water. They eat a wide variety of native forage plants. Some of their choice foods are acorns, clover, corn, cowpeas, greenbriers, honeysuckle, oats, fescue, and wheat.

Doves.--Doves need open fields without thick ground cover for feeding. Their choice foods are browntop millet, corn, croton, grain sorghum, panicgrass, pine seeds, pokeberries, ragweed, sweetgum, and wheat.

Ducks.--Ducks feed in areas of permanent water or areas that are flooded in winter. Some of their choice foods are acorns, beechnuts, corn, browntop and Japanese millet, and smartweed.

Rabbits.--Among the plants that supply good cover for rabbits are blackberry, multiflora rose, sericea lespedeza, and low-growing brush, shrubs, or annual weeds. Grasses, clover, waste grain, and bark are their main foods.

Squirrels.--Squirrels require wooded areas. A few acres are sufficient if there are hardwoods in the stand. Their choice foods are acorns, beechnuts, blackgum seeds, black cherries, corn, dogwood, hickory nuts, mulberries, maple seeds, pecans, and pine seeds.

Nongame birds.--Many kinds of nongame birds live in George County. Their habitat and their foods vary. Some of these birds eat only insects; a few eat insects and fruits; and others eat insects, acorns, nuts, and fruits.

Fish.--The principal game fish in ponds and streams are bass, bluegills and other sunfish, and

5/ EDWARD G. SULLIVAN, biologist, Soil Conservation Service, prepared this section.

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TABLE 8.--DEGREE OF LIMITATION FOR

Soil	Septic tank filter fields	Campsites
Alaga loamy sand, 0 to 5 percent slopes	Slight	Moderate: sandy
Alaga loamy sand, 5 to 8 percent slopes	Moderate: slope	Moderate: sandy
Alaga loamy sand, 8 to 12 percent slopes	Moderate to severe: slope	Moderate: sandy
Alaga loamy sand, terrace, 0 to 5 percent slopes.	Moderate: high water table	Moderate: flooding
Alaga complex, 12 to 20 percent slopes	Severe: slope	Severe: slope
Angie silt loam, 0 to 2 percent slopes	Severe: slow permeability	Moderate: slow permeability
Atmore fine sandy loam, 0 to 2 percent slopes	Severe: high water table	Severe: wetness
Basin fine sandy loam, 0 to 2 percent slopes	Severe: high water table	Moderate: wetness
Benndale fine sandy loam, 0 to 2 percent slopes.	Slight	Slight
Benndale fine sandy loam, 2 to 5 percent slopes.	Slight	Slight
Benndale fine sandy loam, 5 to 8 percent slopes.	Moderate: slope	Slight
Benndale complex, 2 to 5 percent slopes	Slight	Slight
Benndale complex, 5 to 12 percent slopes	Moderate to severe: slope	Moderate: slope
Cahaba fine sandy loam, 0 to 2 percent slopes	Slight	Slight
Cahaba fine sandy loam, 12 to 17 percent slopes	Severe: slope	Moderate: slope
Dorovan-Johnston association	Severe: flooding; wetness	Severe: flooding; wetness
Eustis loamy sand, 0 to 5 percent slopes	Slight	Moderate: sandy
Eustis loamy sand, 5 to 12 percent slopes	Moderate to severe: slope	Moderate: sandy
Eustis loamy sand, 12 to 20 percent slopes	Severe: slope	Severe: slope
Harleston fine sandy loam, 0 to 2 percent slopes.	Moderate: high water table	Slight
Harleston fine sandy loam, 2 to 5 percent slopes.	Moderate: high water table	Slight
Lakeland sand, 0 to 5 percent slopes	Slight	Moderate: sandy
Lakeland sand, 5 to 17 percent slopes	Moderate to severe: slope	Moderate to severe: slope; sandy.
Leaf-Lenoir association	Severe: flooding; wetness	Severe: flooding; wetness
Lenoir silt loam	Severe: slow permeability; wetness.	Severe: wetness
Lucedale sandy loam, 0 to 2 percent slopes	Slight	Slight
Lucedale sandy loam, 2 to 5 percent slopes	Slight	Slight

See footnote at end of table.

Picnic areas	Intensive play areas	Light industry [1/]	Trafficways
Moderate: sandy--------	Severe: sandy----------	Slight----------	Slight.
Moderate: sandy--------	Severe: slope; sandy-----	Moderate: slope---------	Moderate: slope.
Moderate: sandy--------	Severe: slope; sandy-----	Severe: slope----------	Severe: slope.
Moderate: flooding-----	Moderate to severe: flooding.	Severe: flooding--------	Severe: flooding.
Severe: slope----------	Severe: slope----------	Severe: slope----------	Severe: slope.
Slight----------	Moderate: slow permeability.	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Severe: wetness--------	Severe: wetness----------	Severe: wetness---------	Severe: wetness.
Slight to moderate: wetness.	Moderate: wetness--------	Severe: wetness---------	Moderate: wetness.
Slight----------	Slight----------	Moderate: moderate bearing strength.	Slight to moderate: moderate to high traffic-supporting capacity.
Slight----------	Moderate: slope----------	Moderate: moderate bearing strength.	Slight to moderate: moderate to high traffic-supporting capacity.
Slight----------	Severe: slope----------	Moderate: slope---------	Moderate: slope.
Slight----------	Moderate: slope----------	Moderate: moderate bearing strength.	Slight to moderate: moderate to high traffic-supporting capacity.
Moderate: slope--------	Severe: slope----------	Severe: slope----------	Moderate: slope; moderate traffic-supporting capacity.
Slight----------	Slight----------	Moderate: moderate bearing strength.	Slight.
Moderate: slope--------	Severe: slope----------	Severe: slope----------	Moderate to severe: slope.
Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.
Moderate: sandy--------	Severe: sandy----------	Slight----------	Slight.
Moderate: sandy--------	Severe: sandy; slope-----	Moderate to severe: slope.	Moderate: slope.
Severe: slope; sandy---	Severe: slope; sandy-----	Severe: slope----------	Severe: slope.
Slight----------	Slight----------	Moderate: moderate bearing strength.	Slight to moderate: low to moderate traffic-supporting capacity.
Slight----------	Moderate: slope----------	Moderate: moderate bearing strength.	Slight to moderate: low to moderate traffic-supporting capacity.
Moderate: sandy--------	Severe: sandy----------	Slight----------	Slight.
Moderate to severe: slope; sandy.	Severe: slope----------	Moderate to severe: slope.	Moderate to severe: slope.
Severe: flooding; wetness.	Severe: flooding; wetness; slow permeability.	Severe: flooding; wetness.	Severe: wetness; slow permeability; flooding.
Moderate: high water table below 20 inches when in use.	Severe: wetness----------	Severe: wetness; high shrink-swell potential.	Severe: wetness; high shrink-swell potential.
Slight----------	Slight----------	Moderate: moderate bearing strength.	Slight to moderate: low to moderate traffic-supporting capacity.
Slight----------	Moderate: slope----------	Moderate: moderate bearing strength.	Slight to moderate: low to moderate traffic-supporting capacity.

TABLE 8.--DEGREE OF LIMITATION FOR

Soil	Septic tank filter fields	Campsites
McLaurin fine sandy loam, 0 to 2 percent slopes.	Slight----------	Slight----------
McLaurin fine sandy loam, 2 to 5 percent slopes.	Slight----------	Slight----------
McLaurin fine sandy loam, 5 to 8 percent slopes.	Moderate: slope----------	Slight----------
McLaurin fine sandy loam, 8 to 12 percent slopes.	Moderate to severe: slope-	Moderate: slope----------
Myatt silt loam, 0 to 2 percent slopes--------	Severe: flooding; high water table.	Severe: flooding----------
Rumford sandy loam, 0 to 2 percent slopes-----	Slight----------	Slight----------
Susquehanna fine sandy loam, 2 to 5 percent slopes.	Severe: high shrink-swell potential; very slow permeability.	Moderate: wetness; very slow permeability.
Susquehanna fine sandy loam, 5 to 8 percent slopes.	Severe: high shrink-swell potential; very slow permeability.	Moderate: wetness; slow permeability.
Susquehanna fine sandy loam, 8 to 12 percent slopes.	Severe: high shrink-swell potential; slope; very slow permeability.	Moderate: very slow permeability.
Susquehanna complex, 2 to 5 percent slopes----	Severe: high shrink-swell potential; very slow permeability.	Moderate: wetness; very slow permeability.
Susquehanna complex, 5 to 12 percent slopes---	Severe: high shrink-swell potential; slope; very slow permeability.	Moderate: very slow permeability.
Susquehanna complex, 12 to 17 percent slopes--	Severe: high shrink-swell potential; slope; very slow permeability.	Moderate: very slow permeability.
Susquehanna-Benndale complex, 12 to 17 percent slopes.	Severe: high shrink-swell potential; slope; very slow permeability.	Moderate: very slow permeability; slope.

1/ Engineers and others should not apply specific values to the estimates given for bearing strength of soils.

TOWN AND COUNTRY PLANNING--Continued

Picnic areas	Intensive play areas	Light industry 1/	Trafficways
Slight	Slight	Moderate: moderate bearing strength.	Slight to moderate: high to moderate traffic-supporting capacity.
Slight	Moderate: slope	Moderate: moderate bearing strength.	Slight to moderate: high to moderate traffic-supporting capacity.
Slight	Severe: slope	Moderate: slope	Moderate: slope.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope.
Severe: flooding	Severe: flooding	Severe: high water table; flooding.	Severe: high water table; flooding.
Slight	Slight	Moderate: low to moderate bearing strength.	Slight.
Moderate: wetness; very slow permeability.	Moderate: wetness; slope.	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Moderate: very slow permeability.	Severe: slope; wetness	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Moderate: very slow permeability.	Severe: slope	Severe: high shrink-swell potential; slope.	Severe: high shrink-swell potential.
Moderate: wetness; very slow permeability.	Moderate: wetness; slope.	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Moderate: very slow permeability.	Severe: slope	Severe: slope; high shrink-swell potential.	Severe: high shrink-swell potential.
Moderate: very slow permeability.	Severe: slope	Severe: slope; high shrink-swell potential.	Severe: high shrink-swell potential.
Moderate: very slow permeability.	Severe: slope	Severe: slope; high shrink-swell potential.	Severe: high shrink-swell potential.

channel catfish. Bluegills and most of the other sunfish eat aquatic worms and insects and their larvae. Bass and catfish eat small fish, frogs, crayfish, and other aquatic animals. The numbers and poundage of usable fish produced in ponds are related to the abundance of the food supply in the water, the extent of the watershed, and the fertility of the soil at the bottom of the pond. Most ponds in the county need fertilizer and lime to maintain the food supply that will support a good crop of fish.

Wildlife Groups

In the following paragraphs the suitability of the soils for use as wildlife habitat is discussed under three general soil groupings. The soils in each group are similar in their ability to support plant associations for various species of wildlife and to maintain a desirable quality of water for fish.

Wildlife Group 1

This wildlife group is coextensive with the McLaurin-Benndale-Lucedale association, which consists of well-drained, nearly level to strongly sloping soils. The soils occur mainly on broad ridges and the main interstream divides. The association covers about 32 percent of the county. Most of the acreage used for row crops and pasture is in this wildlife group.

Bobwhite quail, doves, and rabbits find a wide variety of habitat on the soils of this wildlife group. Small farms break the area into open land interspersed with wooded areas. The soils are suited to nearly all the food plants commonly preferred by quail. Several of the important food plants for quail, especially beggarticks, partridgepeas, wild beans, and lespedeza, grow abundantly around the fields, in idle areas, and in semiopen stands of longleaf pine. Cover plants grow naturally and in sufficient numbers.

Native plants that supply food and cover for rabbits grow abundantly around fields and pastures in these soils.

Doves are limited to open fields where waste grains and native grass seeds furnish most of their food. Browntop millet, a choice food for doves, is well suited to the soils of this group.

The woodland is predominantly pine, but there are a few scattered hardwoods. Many of the hardwoods are scrub oaks, such as blackjack oak, turkey oak, and runner oak. Turkey oak, runner oak, and several varieties of native blueberries are well suited as understory plants in pine woods, and they are an important source of wildlife foods. The capacity of such woodlands to support bobwhite quail, turkeys, and squirrels depends largely on the abundance of acorns. Encouraging the growth of oaks in stands of pine improves the habitat for wildlife.

Suitability of areas for waterfowl is limited by topography and other natural conditions. A few areas are suitable for development as feeding areas for waterfowl if a water supply for flooding is available.

Many farm ponds have been constructed, and there are sites suitable for others. Most of the soils of this group are acid, however, and better production of fish is likely if ponds are limed before they fill with water.

A wide variety of songbirds thrive in this area. The abundance and variety of food and cover plants along edges and breaks between farmland and forest provide good habitat for many birds.

Wildlife Group 2

This group is coextensive with the McLaurin-Susquehanna-Alaga and the Susquehanna-Benndale associations, which consist of somewhat poorly drained to somewhat excessively drained, nearly level to moderately steep soils on uplands. It covers about 39 percent of the county. The soils are dissected by numerous small streams, drainageways, and springheads. The acreage is used mostly for woodland, but a few small farms are used for row crops and pasture. Pines are the principal trees; scattered hardwoods grow along the small streams.

The soils of this wildlife group provide good habitat for forest game. In some areas, they also provide habitat for quail. The more open, older stands of longleaf pine are suitable for this purpose. Burning is a common practice to stimulate the growth of leguminous plants that are choice food for quail. A few openings and the encouragement of scrub oaks, in combination with periodic controlled burning, produces good populations of bobwhite quail. Quail, rabbits, and doves thrive around small farms where plants that provide food and cover for wildlife grow naturally.

All the soils of this wildlife group are average habitat for deer, turkeys, and squirrels, and these animals are present in good numbers. The native foods grow abundantly, especially along the many small streams. The range for deer and turkey extends also to the soils of wildlife group 3.

Sites suitable for ponds and lakes are fairly common, but they must be checked carefully for water-holding capacity. Some of the soils are very strongly acid, and lime is necessary for good production of fish.

Wildlife Group 3

This wildlife group is coextensive with the Harleston-Lenoir-Atmore and the Leaf-Lenoir associations, which consist of moderately well drained to poorly drained soils on flood plains and adjacent areas. Minor soils included in the associations are well drained to very poorly drained. Wet, marshy areas and numerous small lakes occur along

the Pascagoula River. The soils of this group are mostly in timber. Most of the Leaf-Lenoir association is in hardwoods. A few farms have small areas of row crops and pasture. Some of the areas are in large holdings owned by wood-using industries.

The soils of this group are excellent for forest game and include some of the more desirable wildlife habitat in the State. The variety of hardwood trees and understory vegetation suited to these soils provides choice food for turkeys, deer, and squirrels. Game populations are generally good. The soils are suited to winter forage crops that can be planted in forest openings, and such openings generally produce sufficient native foods if maintenance practices are applied.

Natural lakes and marshes in this area have some value for waterfowl. Some of these are suitable for further development. Japanese millet is well suited to the wet soils. Browntop millet is suited to the better drained soils, where waterfowl areas could be developed.

This area is not well suited to farm game species, because of the forest types, except around the small farms.

Sites for ponds and lakes are limited because of topography and the hazard of flooding.

This area has an abundant nongame bird population and attracts some of the less common species that frequent the larger river systems, marshes, natural lakes, and hardwood forests.

FORMATION AND CLASSIFICATION OF THE SOILS

This section discusses the five factors of soil formation and the processes of horizon differentiation. It also shows the classification of the soils by higher categories.

Formation of the Soils

The five major factors of soil formation are climate, living organisms, parent material, topography, and time. The nature of the soil at any point on earth depends upon the combined effects of these factors. All five come into play in the genesis of every soil, but the relative importance of each may differ from place to place.

Climate

Climate affects the physical, chemical, and biological relationships of the soils, primarily through precipitation and temperature. Water dissolves minerals, supports biological activity, and transports minerals and organic residue through the soil. Temperature influences the kinds and growth of organisms and the speed of physical and chemical reactions. The climate of this county is warm and moist. It is dominated by the presence of the Gulf of Mexico, only 25 miles from its southern boundary. The average annual precipitation is the highest in the State. The average annual temperature is 67° F. (6). Such a climate produces highly leached, strongly acid soils that are low in bases.

Living Organisms

Micro-organisms, plants, earthworms, and all other organisms that live in or on the soil are important in the formation of soils. Bacteria, fungi, and other micro-organisms help in weathering rock and in decomposing organic matter. Larger plants alter the microclimate, supply organic matter, and transfer elements from the subsoil to the surface.

Parent Material

Parent material is the unconsolidated mass from which the soil develops. It is largely responsible for the chemical and mineralogical composition of soils. The soils on uplands in this county formed in marine and fluvial deposits ranging from sands to clays. The soils on terraces and the larger flood plains formed in alluvium, or material transported and deposited by streams. The organic soils, such as those of the Dorovan series, formed in decaying leaves, twigs, branches, and other kinds of vegetation that have accumulated in a saturated environment.

Topography

Topography affects soil formation through its influence on drainage, erosion, vegetation, and soil temperature. George County occupies an area dissected by streams and rivers. The elevation ranges from about 20 to 300 feet above sea level, and the slope ranges from 0 to 20 percent. Interstream divides south of Lucedale are mainly nearly level to gently sloping, as are the large flood plains and adjacent terraces along the Pascagoula and Escatawpa Rivers. Other upland areas are moderately steep and are cut by many small drainageways.

Time

The length of time required for soil development depends largely on the effects of the other four factors of soil formation. Less time is generally required for a soil to develop in warm, humid regions where the vegetation is luxuriant than in dry, cold regions where the vegetation is scant. Also, other factors being equal, less time is required if the parent material is coarse textured than if it is fine textured.

Fairly stable, nearly level soils on interstream divides have more strongly developed horizons than sloping soils in which the rate of geological

erosion approaches that of soil development. Soils of the flood plains of George County formed in relatively young deposits and generally are less weathered and have a thinner solum than soils of the uplands.

Processes of Horizon Differentiation

The processes involved in the formation of soil horizons in this county are (1) accumulation of organic matter; (2) leaching of calcium carbonates and bases; (3) reduction and transfer of iron; and (4) formation and translocation of silicate clay minerals. More than one of these processes has been active in most soils.

The accumulation of organic matter in the upper part of the profile has been important in the formation of an A1 horizon. The soils of George County range from very low to high in organic-matter content.

Carbonates and bases have been strongly leached from nearly all the soils of this county. This leaching has contributed to the development of horizons. Some soil scientists agree that leaching of bases from the upper horizons of a soil generally precedes the translocation of silicate clay minerals.

The reduction and transfer of iron, or gleying, is evident in the poorly drained soils. The process of gleying is evident in the gray color of the subsoil. Some horizons contain yellowish-red and strong-brown mottles and concretions, an indication of the segregation of iron.

In some soils of this county, the translocation of clay minerals has contributed to the development of horizons. The eluviated A2 horizon is generally lighter in color and has less clay than the Bt horizon because the clay has moved downward. The Bt horizon has thin clay films on ped surfaces or has coatings and bridgings of sand grains, as well as the thin clay films.

Classification of the Soils

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (2) and later revised (9). The system currently used was adopted for general use by the National Cooperative Soil Survey in 1965 and supplemented in March 1967 and in September 1968 (12). This system is under continual study, and readers interested in the development of the system should refer to the latest literature available.

The current system of classification defines classes in terms of observable or measurable properties of soils (8). It has six categories. Beginning with the most inclusive, the categories are the order, the suborder, the great group, the subgroup, the family, and the series. The placement of some soil series, particularly in families, may change as more precise information becomes available.

Table 9 shows the classification of the soil series of George County according to the current system. Some of the soils in this county do not fit in a series that has been recognized in the classification system, but recognition of a separate series would not serve a useful purpose. Such soils are named for series they strongly resemble because they differ from those series in ways too small to be of consequence in interpreting their usefulness or behavior. Soil scientists designate such soils as taxadjuncts to the series for which they are named. In this survey soils named in the Lenoir series are taxadjuncts to that series.

Following are brief descriptions of the six categories in the current system.

ORDER. Ten soil orders are recognized. Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate among soil orders are those that tend to give broad climatic groupings of soils. The two exceptions to this are Entisols and Histosols, which occur in many different climates.

As shown in table 9, five soil orders are represented in George County: Alfisols, Entisols, Histosols, Inceptisols, and Ultisols. Alfisols have a clay-enriched B horizon that is high in base saturation. Entisols are recent soils; they lack genetic horizons or have only the beginning of such horizons. Histosols formed in organic material. They are composed of muck or peat. Inceptisols occur most often on young, but not recent, land surfaces. Ultisols are mineral soils that are restricted to humid climates. They are commonly on old land surfaces. They are highly weathered and strongly developed, and they have a low base saturation.

SUBORDER. Each order is divided into suborders, which are based primarily on characteristics that seem to produce classes that have the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders are mainly those that reflect either the presence or absence of waterlogging, or those that reflect differences resulting from the climate or vegetation.

GREAT GROUP. Each suborder is divided into great groups on the basis of similarity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus has accumulated; or those that have a pan that interferes with the growth of roots or the movement of water. The features used are the self-mulching properties of clay, soil temperature, and major differences in chemical composition, mainly in calcium, magnesium, sodium, potassium, and the like.

SUBGROUP. Each great group is divided into subgroups, one representing the central, or typical, segment of the group and the others, called

intergrades, that have properties of the group and also one or more properties of another great group, suborder, or order. Subgroups may also be established in those instances where soil properties intergrade outside the range of any recognized great group, suborder, or order.

FAMILY. Families are established within a subgroup primarily on the basis of properties important to the growth of plants or the behavior of soils when they are used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence.

SERIES. The series has the narrowest range of characteristics of the categories in the classification system. It is described fully in the section "How This Soil Survey Was Made."

TABLE 9.--CLASSIFICATION OF SOIL SERIES

Series	Family	Subgroup	Order
Alaga	Siliceous, thermic, coated	Typic Quartzipsamments	Entisols.
Angie	Clayey, mixed, thermic	Aquic Paleudults	Ultisols.
Atmore	Coarse-loamy, siliceous, thermic	Plinthic Fragiaquults	Ultisols.
Basin	Coarse-loamy, siliceous, thermic	Plinthaquic Fragiudults	Ultisols.
Benndale	Coarse-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Cahaba	Fine-loamy, siliceous, thermic	Typic Hapludults	Ultisols.
Dorovan	Dysic, thermic	Typic Medisaprists	Histosols.
Eustis	Sandy, siliceous, thermic	Psammentic Paleudults	Ultisols.
Harleston	Coarse-loamy, siliceous, thermic	Aquic Paleudults	Ultisols.
Johnston	Coarse-loamy, siliceous, acid, thermic	Cumulic Humaquepts	Inceptisols.
Lakeland	Siliceous, thermic, coated	Typic Quartzipsamments	Entisols.
Leaf	Clayey, mixed, thermic	Typic Albaquults	Ultisols.
Lenoir	Clayey, mixed, thermic	Aeric Paleaquults	Ultisols.
Lucedale	Fine-loamy, siliceous, thermic	Rhodic Paleudults	Ultisols.
McLaurin	Coarse-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Myatt	Fine-loamy, siliceous, thermic	Typic Ochraquults	Ultisols.
Rumford	Coarse-loamy, siliceous, thermic	Typic Hapludults	Ultisols.
Susquehanna	Fine, montmorillonitic, thermic	Vertic Paleudalfs	Alfisols.

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GLOSSARY

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as crumbs, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed 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 capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

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.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

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.--When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a wire when rolled between thumb and forefinger.

Sticky.--When wet, 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 and brittle; little affected by moistening.

Diversion, or diversion terrace. A ridge of earth, generally a terrace, that is built to divert runoff from its natural course and, thus, to protect areas downslope from the effects of such runoff.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Horizon, soil. A layer of soil approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.--The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.--The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of the following: soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.--The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by

accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.--The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.--Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B 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.

Leaching, soil. The removal of soluble materials from soils or other material by percolating water.

Mottled. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of 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 these: fine, less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; medium, ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and coarse, more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Muck. An organic soil consisting of fairly well decomposed organic material that is relatively high in mineral content, finely divided, and dark colored.

Natural soil drainage. Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, 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 different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottling at a depth below 6 to 16 inches.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Permanent pasture. Pasture that is on the soil for a long time, in contrast to rotation pasture, which is on the soil for only 1 or 2 years because it is grown in rotation with other crops.

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: very slow, slow, moderately slow, moderate, moderately rapid, rapid, and very rapid.

Productivity (of soil). The present capability of the soil for producing a specified plant or sequence of plants under a specified system of management. It is measured in terms of output, or harvest, in relation to input of production for the specified kind of soil under a specified system of management.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	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

Relief. The elevations or inequalities of a land surface, considered collectively.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz,

but they may be any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoinging aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. 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 (1) single grain (each grain by itself, as in dune sand) or (2) massive (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. Technically, the part of the soil below the solum.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surplus runoff so that it may soak into the soil or flow slowly to a prepared outlet without harm. Terraces in fields are generally built so they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

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."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil. A presumed fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Upland. Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. The suitability of each mapping unit for use as cropland is discussed in the description of the mapping unit. The capability classification system is discussed on pages 25 to 27. For a description of woodland forage sites, see pages 30 to 34. For a description of wildlife groups, see pages 52 and 53. Other information is given in tables as follows:

Temperature and precipitation, table 1, page 2.
Acreage and extent, table 2, page 6.
Estimated yields, table 3, page 28.
Woodland groups, table 4, page 31.
Engineering uses of the soils, tables 5, 6, and 7, pages 36 through 45.
Town and country planning, table 8, page 48.
Classification of soil series, table 9, page 55.

Map symbol	Mapping unit	Described on page	Capability unit	Woodland group	Woodland forage site		Wildlife group	
			Symbol	Symbol	Number	Page	Number	Page
AgB	Alaga loamy sand, 0 to 5 percent slopes	7	IIIs-1	3s2	2	33	2	52
AgC	Alaga loamy sand, 5 to 8 percent slopes	7	IVs-1	3s2	2	33	2	52
AgD	Alaga loamy sand, 8 to 12 percent slopes	7	VIs-1	3s2	2	33	2	52
AlB	Alaga loamy sand, terrace, 0 to 5 percent slopes	7	IIIs-1	2s2	2	33	3	52
AmE	Alaga complex, 12 to 20 percent slopes	7	VIIs-1	3s2	2	33	2	52
AnA	Angie silt loam, 0 to 2 percent slopes	8	IIw-2	2w8	1	33	3	52
AtA	Atmore fine sandy loam, 0 to 2 percent slopes	9	IVw-1	3w9	3	34	3	52
BaA	Basin fine sandy loam, 0 to 2 percent slopes	10	IIIw-1	2w8	3	34	3	52
BeA	Benndale fine sandy loam, 0 to 2 percent slopes	11	IIs-1	2o1	1	33	1	52
BeB	Benndale fine sandy loam, 2 to 5 percent slopes	11	IIe-1	2o1	1	33	1	52
BeC	Benndale fine sandy loam, 5 to 8 percent slopes	11	IIIe-1	2o1	1	33	1	52
BnB	Benndale complex, 2 to 5 percent slopes	11	IIe-1	2o1	1	33	1	52
BnC	Benndale complex, 5 to 12 percent slopes	11	IIIe-1	2o1	1	33	1	52
CaA	Cahaba fine sandy loam, 0 to 2 percent slopes	12	I-1	2o7	1	33	3	52
CaE	Cahaba fine sandy loam, 12 to 17 percent slopes	12	VIe-1	2o1	1	33	1	52
Dh	Dorovan-Johnston association	13	VIIw-1	1w9	3	34	3	52
EsB	Eustis loamy sand, 0 to 5 percent slopes	14	IIIs-1	3s2	2	33	1	52
EsD	Eustis loamy sand, 5 to 12 percent slopes	14	VIs-1	3s2	2	33	1	52
EsE	Eustis loamy sand, 12 to 20 percent slopes	14	VIIs-1	3s2	2	33	2	52
HaA	Harleston fine sandy loam, 0 to 2 percent slopes	15	IIw-1	2w8	1	33	3	52
HaB	Harleston fine sandy loam, 2 to 5 percent slopes	15	IIe-2	2w8	1	33	3	52
LeB	Lakeland sand, 0 to 5 percent slopes	16	IVs-2	4s3	2	33	2	52
LeE	Lakeland sand, 5 to 17 percent slopes	17	VIIs-2	4s3	2	33	2	52
Lf	Leaf-Lenoir association	17	IVw-1	2w9	3	34	3	52
Ln	Lenoir silt loam	18	IIIw-1	2w8	3	34	3	52
LuA	Lucedale sandy loam, 0 to 2 percent slopes	19	I-1	2o1	1	33	1	52
LuB	Lucedale sandy loam, 2 to 5 percent slopes	19	IIe-1	2o1	1	33	1	52

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Capability unit	Woodland group	Woodland forage site		Wildlife group	
			Symbol	Symbol	Number	Page	Number	Page
MlA	McLaurin fine sandy loam, 0 to 2 percent slopes	19	IIs-1	2o1	1	33	1	52
MlB	McLaurin fine sandy loam, 2 to 5 percent slopes	20	IIe-1	2o1	1	33	1	52
MlC	McLaurin fine sandy loam, 5 to 8 percent slopes	20	IIIe-1	2o1	1	33	1	52
MlD	McLaurin fine sandy loam, 8 to 12 percent slopes	20	IVe-1	2o1	1	33	1	52
MyA	Myatt silt loam, 0 to 2 percent slopes	21	IVw-1	2w9	3	34	3	52
RuA	Rumford sandy loam, 0 to 2 percent slopes	22	IIs-1	2o7	1	33	3	52
SnB	Susquehanna fine sandy loam, 2 to 5 percent slopes	23	IVe-2	3c2	1	33	2	52
SnC	Susquehanna fine sandy loam, 5 to 8 percent slopes	23	VIe-2	3c2	1	33	2	52
SnD	Susquehanna fine sandy loam, 8 to 12 percent slopes	23	VIe-2	3c2	1	33	2	52
SuB	Susquehanna complex, 2 to 5 percent slopes	23	IVe-2	3c2	1	33	2	52
SuD	Susquehanna complex, 5 to 12 percent slopes	23	VIe-2	3c2	1	33	2	52
SuE	Susquehanna complex, 12 to 17 percent slopes	24	VIIe-1	3c2	1	33	2	52
SxE	Susquehanna-Benndale complex, 12 to 17 percent slopes	24						
	Susquehanna	--	VIIe-1	3c2	1	33	2	52
	Benndale	--	VIIe-1	2o1	1	33	2	52

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