SOIL SURVEY

Tallahatchie County Mississippi

Issued February 1970

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
MISSISSIPPI AGRICULTURAL EXPERIMENT STATION

Major fieldwork for this soil survey was done in the period 1959 through 1965. Soil names and descriptions were approved in 1966. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1965. This survey was made cooperatively by the Soil Conservation Service and the Mississippi Agricultural Experiment Station.

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, USDA, 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, or other structures; and in judging the suitability of tracts of land for agriculture, industry, or recreation.

Locating Soils

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

On each sheet of the detailed map, soil areas are outlined and are identified by symbol. 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 in the survey. This guide lists all of the soils of the county in alphabetic order by map symbol. It shows the page where each kind of soil is described, and also the page for the capability unit and woodland suitability group in which the soil has been placed.

Individual colored maps showing the relative suitability or limitations of soils for many specific purposes can be developed by using the soil map and 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 in the soil descriptions and in the discussions of the capability units, woodland suitability groups, and wildlife areas.

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.

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

Community planners and others concerned with suburban development can read about the soil properties that affect the choice of homesites, industrial sites, schools, and parks in the section "Use of the Soils for Recreation."

Engineers and builders will find under "Use of the Soils in Engineering" tables that give engineering descriptions of the soils in the county and that name soil features that affect engineering practices and structures.

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

Newcomers in Tallahatchie 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 section "General Nature of the County," which gives additional information about the county.

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SOIL SURVEY OF TALLAHATCHIE COUNTY, MISSISSIPPI

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

TALLAHATCHIE COUNTY is in the northwestern part of Mississippi (fig. 1) and occupies a total land area of 644 square miles. The county is about 24 miles long and about 30 miles wide. It has two county seats, Charleston and Sumner. Charleston, in the eastern part of the county, is 73 miles south of Memphis, Tenn.

The county is mostly agricultural, although cotton and other crops are processed, and some articles are manufactured. Cotton, soybeans, oats, and corn are the main crops. Some livestock is raised.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Tallahatchie 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. As they traveled over the county, 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 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. Dundee and Dubbs, 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.

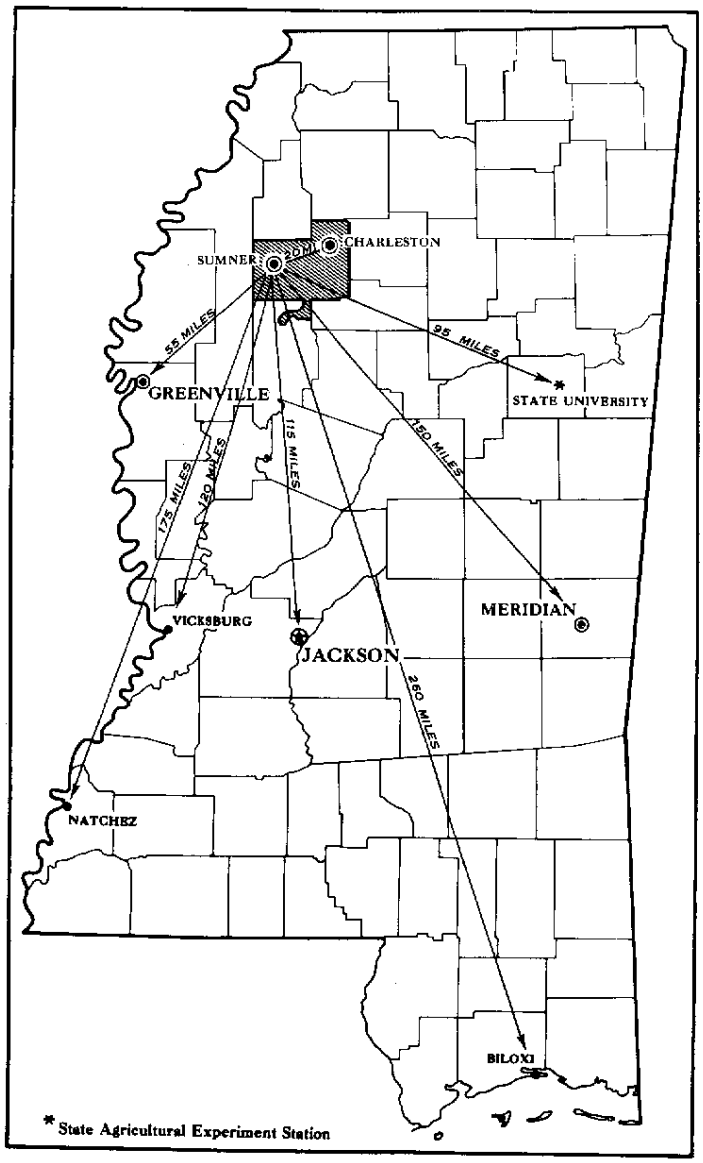

Figure 1.—Location of Tallahatchie County in Mississippi.

Soils of one series can differ in texture of the surface soil 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, Dundee silt loam, 2 to 5 percent slopes, is one of several phases within the Dundee 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 the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning 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. Three such kinds of mapping units are shown on the soil map of Tallahatchie County: soil complexes, soil associations, and undifferentiated groups.

A soil complex consists of areas of two or more soils, so intricately mixed 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. Memphis-Natchez complex, 17 to 40 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. Falaya-Waverly association is an example.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purposes of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." Dundee and Tensas silt loams, 0 to 3 percent slopes, is an example.

In most areas surveyed there are places where the soil material is so rocky, so shallow, or so severely eroded that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Gullied land is a land type in Tallahatchie County.

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 soils 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 soils. 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 rangeland, 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 present methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Tallahatchie 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 farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect management.

The seven soil associations in Tallahatchie County are described in the following pages.

1. Alligator-Forestdale association

Nearly level, poorly drained soils that are fine textured or moderately fine textured throughout; formed in Mississippi River alluvium on broad flats and old natural levees

This soil association is in the western and central parts of the county. It covers about 28 percent of the county. Alligator soils make up about 70 percent of the association, and Forestdale soils 15 percent. Alligator clay, depressional, and other minor soils make up the rest.

Alligator soils are on broad flats. They are poorly drained. They have a surface layer of dark grayish-brown clay and silty clay loam, about 5 inches thick, over gray clay. Forestdale soils occur as narrow bands adjacent to old stream channels and as gently undulating ridges. They are poorly drained. They have a surface layer of dark grayish-brown silty clay loam, about 6 inches thick, over light brownish-gray silty clay and gray silty clay loam.

Alligator clay, depressional, occupies the bottoms of old stream runs and depressions. It is poorly drained. It has a very dark grayish-brown surface layer, about 5 inches thick, over dark-gray to gray clay.

This association is suitable for crops and pasture, but drainage is needed for removal of excess surface water. About 25 percent of the area is wooded, and about 75 percent is open. Most of the open land is used for crops, such as soybeans, cotton, and small grain. A small part is used for improved pasture.

This association has severe limitations for residential or industrial development because the soils shrink and crack open in dry weather and swell in wet weather.

Because of poor trafficability, this area has severe limitations for recreational uses other than hunting and fishing. Growth of trees and of wildlife food and cover plants is good.

2. *Alligator association*

Level to gently undulating, poorly drained soils that are fine textured throughout; formed in Mississippi River alluvium on broad flats

This soil association is in the north-central and southern parts of the county. It covers about 4 percent of the county. There are some meandering depressions. Alligator soils make up about 95 percent of the association. Waverly, Falaya, and Calhoun soils make up the rest.

Alligator soils are on broad flats. They are poorly drained. They have a surface layer of dark grayish-brown clay, about 5 inches thick, over gray clay. Alligator clay, depressional, occupies the bottoms of old stream runs and depressions. It is poorly drained. It has a surface layer of very dark grayish-brown clay, about 5 inches thick, over gray to dark-gray clay.

This association is suitable for crops and pasture. It needs drainage for removal of excess surface water. About 35 percent of the area is wooded, and about 65 percent is open. Most of the open land is used for soybeans, small grain, and cotton. A small amount is used for improved pasture.

This association has severe limitations for residential or industrial development, because the soils shrink and crack open in dry weather and swell in wet weather. The areas are not suitable for recreational uses, except hunting. Growth of trees and wildlife food and cover plants is good.

3. *Dundee-Dubbs association*

Nearly level to gently sloping, somewhat poorly drained to well-drained soils that have a medium-textured or moderately fine textured subsoil; formed in Mississippi River alluvium on old natural levees and low stream terraces

This soil association is in the central and western parts of the county. It covers about 27 percent of the county. Dundee soils make up about 50 percent of the association, and Dubbs soils about 40 percent. Narrow depressions occur throughout the acreage.

Dundee soils are somewhat poorly drained. They have a surface layer of dark grayish-brown silt loam, about 7 inches thick, and a subsoil of dark grayish-brown silty clay loam over mottled silt loam. Dubbs soils occur at slightly higher elevations than Dundee soils. They are moderately well drained to well drained. They have a surface layer of dark grayish-brown very fine sandy loam and a subsoil of yellowish-brown silty clay loam over yellowish-brown loam mottled with gray.

The rest of the association is made up of well-drained, coarse, silty Tutwiler soils, at higher elevations than the major soils, and of poorly drained Forestdale silt loam, depressional, and Alligator clay, depressional, and somewhat poorly drained Tensas soils, all at slightly lower elevations.

This association is suitable for row crops and pasture. Most of the open land is used for crops, such as cotton, soybeans, and small grain, and for improved pasture.

This association has slight to moderate limitations for residential, industrial, and recreational development.

4. *Collins-Falaya association*

Nearly level, moderately well drained and somewhat poorly drained soils that are medium textured throughout; formed in silty alluvium on flood plains and in upland drainageways

This soil association is in the eastern part of the county. It covers about 10 percent of the county. Collins soils make up about 45 percent of the association, and Falaya soils about 15 percent.

Collins soils occur in upland drainageways and on the flood plains adjacent to the bluff hills. They have a surface layer of brown silt loam, about 7 inches thick, over yellowish-brown to brown silt loam mottled with gray at a depth below 18 inches. Falaya soils occur chiefly in small areas away from the streams and in moderately wide areas on the flood plains. They have a surface layer of brown silt loam over brown silt loam mottled with gray and, below a depth of 17 inches, predominantly gray silt loam.

The rest of the association is made up of well-drained Vicksburg soils, adjacent to streams; poorly drained Waverly soils, in low areas; moderately well drained Grenada soils, on terraces; and excessively drained Bruno soils, moderately well drained Leverett soils, and somewhat poorly drained Tippo soils, all on older flood plains.

This association is suitable for crops and pasture. Most of it is open, but a small acreage is wooded. The open land is used for crops, such as cotton, soybeans, small grain, and corn. A small part is used for improved pasture.

Because of flooding, corrosion potential, and trafficability, this association has slight to moderate limitations for residential and industrial development and for recreational uses other than hunting and fishing.

5. *Falaya-Collins association*

Nearly level, somewhat poorly drained and moderately well drained soils that are medium textured throughout; formed in silty alluvium on flood plains and in upland drainageways

This soil association is mainly in the eastern half of the county. It covers about 4 percent of the county. Falaya soils make up about 50 percent of the association, and Collins soils about 10 percent.

Falaya soils have a surface layer of brown silt loam over brown silt loam mottled with gray at a depth of about 7 inches and dominantly gray below a depth of 17

inches. Collins soils have a surface layer of brown silt loam over yellowish-brown to dark-brown silt loam mottled with gray at a depth of 14 inches and dominantly gray below a depth of 23 inches.

The rest of the association is made up of Tutwiler, Leverett, Tippo, and Bruno soils. Tutwiler soils and Bruno soils occupy colluvial fans adjacent to the bluff hills. Leverett soils and Tippo soils occur at slightly higher elevations on the older flood plains. This association is suitable for crops and pasture. Most of the area is open and is used for crops, such as cotton, soybeans, small grain, and corn. A small part is used for improved pasture and hay.

This association has severe limitations for residential and industrial development because of a high water table, flooding, and corrosion potential. It has severe limitations for recreational uses other than hunting, because of poor trafficability. If flooding can be prevented, the limitations are only moderate.

6. *Memphis-Gullied land association*

Moderately sloping to very steep, well-drained soils that formed in loess and have a medium-textured and moderately fine textured subsoil, and very severely gullied land; on uplands

This soil association is in the eastern part of the county. It covers about 23.5 percent of the county. Memphis soils make up about 62 percent of the association, and Gullied land about 15 percent. The ridgetops are narrow to moderately wide, and the side slopes are strongly sloping to very steep. The area is broken by intermittent streams and drains that have narrow bottom lands.

Memphis soils are well drained. They have a surface layer of brown silt loam and a subsoil of dark-brown silty clay loam.

Most of Gullied land is so severely eroded that the soil horizons have been destroyed and only narrow, isolated areas of the original soils remain.

The rest of the association is made up of Loring soils, which have slopes of less than 12 percent; Collins soils, which are on narrow bottom lands; Natchez soils, which are on the upper part of the slopes, near the bluffs; and a gravelly loamy sand that is on the lower part of slopes and has a gradient of more than 25 percent.

This association is suitable for pasture and woodland. The steep and gullied land is mostly forested. The pasture is on the ridges, bottom lands, and rolling hillsides. Selected sites are suitable for industrial or residential development. Dude ranching, hunting, hiking, camping, and horseback riding are possible recreational uses.

7. *Waverly-Calhoun association*

Nearly level, poorly drained soils that are medium textured or moderately fine textured throughout; formed in silty alluvium on flood plains and low stream terraces

This soil association is in the eastern part of the county. It covers about 3.5 percent of the county. Waverly soils make up about 43 percent of the association, and Calhoun soils about 23 percent. Rosebloom, Bonn, and Falaya soils make up the rest.

Waverly soils are on broad flat areas and in depressions. They are poorly drained. Waverly soils have a surface layer of grayish-brown silt loam, about 5 inches thick, over dominantly gray silt loam. Calhoun soils are poorly drained soils that are medium acid or strongly acid in the upper part and slightly acid below a depth of 30 inches. Rosebloom soils are poorly drained, acid, and silty. Bonn soils are poorly drained silty soils that are alkaline below the surface layer. Falaya soils are somewhat poorly drained, acid soils that formed in silty alluvium.

This association is suitable for crops and pasture, but it needs a complete drainage system for removal of excess surface water. About 50 percent of the acreage is open land that is used for crops, such as soybeans, small grain, cotton, and improved pasture.

This association has severe limitations for residential and industrial development because the soils are wet in winter and spring. It is too wet to be developed for recreational activities other than hunting. Growth of trees and wildlife food and cover plants is good.

Descriptions of the Soils

This section describes each of the soil series and the mapping units in Tallahatchie County, Mississippi. The procedure is to describe first a soil series, and then the mapping units in that series. Thus, to get full information on any given mapping unit, it is necessary to read the description of that unit and also the description of the soil series to which it belongs.

The description of each soil series contains a description of a soil profile that is considered typical of the series. If the profile of a given mapping unit differs from this typical profile, the differences are stated in the description of the mapping unit, unless they are apparent from the name of the mapping unit.

Some mapping units, for example, Gullied land, are land types and do not belong to a soil series. Nevertheless, they are described in alphabetic order along with the soil series.

Following the name of each mapping unit is the symbol that identifies the soil or land type on the detailed map at the back of the survey. Shown at the end of each description are the capability unit and the woodland suitability group in which the mapping unit has been placed. The page on which each mapping unit, capability unit, and woodland suitability group is described is listed in the "Guide to Mapping Units." The approximate acreage and proportionate extent of each mapping unit are given in table 1.

Alligator Series

The Alligator series consists of nearly level, poorly drained, acid soils that formed in fine-textured sediments deposited by the Mississippi River and its tributaries. The native vegetation consists of mixed hardwoods, canes, and vines.

In a typical profile, the surface layer is dark grayish-brown clay, about 5 inches thick, and the underlying material, to a depth of 48 inches or more, is mottled gray clay. When dry, these soils shrink and form cracks 1 to

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Area	Extent
	Acres	*Percent*
Alligator clay, 0 to 2 percent slopes	68, 375	16. 6
Alligator clay, depressional	38, 060	9. 2
Alligator silty clay loam, 0 to 2 percent slopes	6, 100	1. 5
Calhoun silt loam	300	. 1
Calhoun-Bonn complex	3, 000	. 7
Calloway silt loam, 0 to 3 percent slopes	895	. 2
Cascilla silt loam, 0 to 3 percent slopes	550	. 1
Collins silt loam	19, 895	4. 8
Collins silt loam, clayey subsoil variant	380	. 1
Crevasse and Bruno soils	410	. 1
Dubbs very fine sandy loam, 0 to 2 percent slopes	25, 960	6. 3
Dubbs very fine sandy loam, 2 to 5 percent slopes	17, 000	4. 1
Dundee silt loam, 0 to 2 percent slopes	37, 075	9. 0
Dundee silt loam, 2 to 5 percent slopes	3, 990	1. 0
Dundee silty clay loam, 0 to 2 percent slopes	5, 900	1. 4
Dundee silty clay loam, 2 to 5 percent slopes	2, 000	. 5
Dundee soils, 5 to 8 percent slopes	1, 260	. 3
Dundee and Tensas silt loams, 0 to 3 percent slopes	18, 515	4. 5
Falaya silt loam	10, 125	2. 5
Falaya-Waverly association	5, 720	1. 4
Forestdale silt loam, depressional	700	. 2
Forestdale silty clay loam, 0 to 3 percent slopes	17, 580	4. 3
Grenada silt loam, 0 to 2 percent slopes	985	. 2
Grenada silt loam, 2 to 5 percent slopes, eroded	1, 520	. 4
Grenada silt loam, 2 to 8 percent slopes, severely eroded	400	. 1
Gullied land-Memphis complex, 8 to 40 percent slopes	19, 285	4. 7
Leverett silt loam, 0 to 2 percent slopes	890	. 2
Leverett silt loam, 2 to 5 percent slopes	480	. 1
Loring silt loam, 0 to 2 percent slopes	550	. 1
Loring silt loam, 2 to 5 percent slopes, eroded	2, 240	. 5
Loring silt loam, 5 to 8 percent slopes, eroded	3, 725	. 9
Loring silt loam, 8 to 12 percent slopes, eroded	2, 160	. 5
Memphis silt loam, 0 to 2 percent slopes	280	. 1
Memphis silt loam, 2 to 5 percent slopes, eroded	1, 230	. 3
Memphis silt loam, 5 to 8 percent slopes, eroded	4, 820	1. 2
Memphis silt loam, 8 to 12 percent slopes, eroded	1, 380	. 3
Memphis silt loam, 5 to 12 percent slopes, severely eroded	9, 485	2. 3
Memphis silt loam, 12 to 17 percent slopes	4, 375	1. 1
Memphis silt loam, 12 to 17 percent slopes, severely eroded	7, 230	1. 8
Memphis silt loam, 17 to 40 percent slopes	24, 085	5. 8
Memphis silt loam, 17 to 40 percent slopes, severely croded	7, 425	1. 8
Memphis-Natchez complex, 17 to 40 percent slopes	3, 540	. 9
Rosebloom silt loam	2, 300	. 6
Sharkey clay	1, 000	. 2
Tippo silt loam, 0 to 2 percent slopes	1, 240	. 3
Tutwiler very fine sandy loam, 0 to 3 percent slopes	3, 295	. 8
Tutwiler-Bruno complex, 0 to 5 percent slopes	1, 690	. 4
Vicksburg silt loam	3, 430	. 8
Vicksburg and Bruno soils	2, 720	. 7
Waverly silt loam	4, 190	1. 0
Miscellaneous [1]	12, 420	3. 0
Total land area	412, 160	100. 0

[1] Includes towns and rivers, lakes, bayous, and other water areas.

3 inches wide and several feet deep. When wet they expand, and the cracks seal.

About 85 percent of the acreage has been cleared and is used for crops and pasture.

Profile of Alligator clay, 0 to 2 percent slopes. The location is 0.25 mile west of White Lake Church, and 200 feet south of a gravel road, in the NW¼NW¼ sec. 21, T. 25 N., R. 1 E. Cultivated field, 1 percent slope.

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) clay; weak, medium, granular structure; firm; many fine and medium roots; strongly acid; abrupt, smooth boundary.

C1g—5 to 26 inches, gray (10YR 5/1) clay; many, fine and medium, distinct mottles of yellowish brown and strong brown; massive with tendency toward weak, medium, subangular blocky structure; very firm when moist; sticky and very plastic when wet; few fine roots; few brown concretions; some mixing from Ap horizon; few slickensides; strongly acid; clear, smooth boundary.

C2g—26 to 48 inches, gray (10YR 5/1) clay; common, fine and medium, distinct mottles of yellowish brown and strong brown; massive; very firm when moist, sticky and very plastic when wet; some mixing from Ap horizon in cracks; common slickensides; medium acid.

The color of the Ap horizon is dark grayish brown to very dark grayish brown. The texture of the Ap horizon ranges from clay to silty clay loam. The C horizon is dominantly gray or light-gray clay. It has few to many distinct mottles of brown to yellow. Some profiles contain few to common, fine, brown and black concretions. The reaction ranges from very strongly acid to medium acid.

Alligator soils occur throughout the delta in the western and central parts of the county, with Sharkey, Forestdale, and Tensas soils. Alligator soils are lighter colored and more acid than Sharkey soils. They are finer textured than Forestdale and Tensas soils, and they lack a B horizon.

Alligator clay, 0 to 2 percent slopes (AcA).—This soil occurs in the western and central parts of the county. It has the profile described as typical of the series. Included in the areas mapped are small areas that have slopes of as much as 3 percent and small areas of Forestdale silty clay loam, of Alligator silty clay loam, and of Alligator clay, depressional.

Water intake is rapid when this soil is dry but very slow when the soil is saturated. The available water capacity is high. The natural fertility is high to moderate. Tillage has to be delayed in spring because of the clay texture and excessive wetness. Runoff is slow, and the erosion hazard is slight.

Approximately 85 percent of this soil is used for cultivated crops or pasture, and the remaining 15 percent for mixed hardwoods. The cultivated acreage requires surface drainage. (Capability unit IIIw–6; woodland suitability group 1)

Alligator clay, depressional (0 to 2 percent slopes) (Ad).—This soil occurs throughout the western and central parts of the county, in depressions 50 to 200 feet wide and up to 2 miles long. Included in the areas mapped are areas of silty clay loam that total less than 15 percent of the acreage and areas of dark-gray, neutral to alkaline Sharkey clay that also total less than 15 percent of the unit.

This Alligator soil has a surface layer of very dark grayish-brown clay about 5 inches thick. The underlying

material, about 40 to 50 inches thick, is gray clay mottled with shades of brown.

Permeability is very slow. The available water capacity is high. The natural fertility is moderate to high. The reaction is strongly acid to medium acid. Tillage is delayed in spring because of the clay texture and excessive wetness. Runoff is slow, and the erosion hazard is slight.

About 75 percent of the acreage is used for cultivated crops or pasture, and the remaining 25 percent is in hardwoods.

Drainage is needed to remove excess surface water and flood water. V-type and W-type ditches, with dragline ditches for outlets, are used. Because it is in depressions, this soil makes a good location for drainage ditches. (Capability unit IVw–2; woodland suitability group 3)

Alligator silty clay loam, 0 to 2 percent slopes (AsA).—This soil occurs chiefly in the central and western parts of the county. About 4 percent of it has slopes of as much as 3 percent. Included in the areas mapped are small areas of a poorly drained, gray, clayey, alkaline soil.

This Alligator soil has a surface layer of dark grayish-brown silty clay loam about 6 inches thick. The underlying material is gray clay mottled with yellowish brown and strong brown. The profile extends to a depth of 50 inches.

Water intake is rapid when the soil is dry but very slow when the soil is saturated. The available water capacity is high. The natural fertility is high. The tilth is slightly better than that of Alligator clay. Runoff is slow.

Approximately 90 percent of this soil is used for cultivated crops or pasture, and the rest is in hardwoods. (Capability unit IIIw–4; woodland suitability group 1)

Bonn Series

The Bonn series consists of nearly level to depressional, poorly drained, alkaline soils that developed in medium-textured materials on flood plains and low terraces. The subsoil contains a large amount of exchangeable sodium. The native vegetation consists of hardwoods, canes, and vines.

In a typical profile, the surface layer is dark grayish-brown silt loam about 6 inches thick. The subsoil, to a depth of 5 feet, consists of mottled silt loam. The uppermost 5 inches of the subsoil is predominantly light gray, the next 19 inches is predominantly light brownish gray, the next 18 inches is mottled gray, light brownish gray, and strong brown, and the next 12 inches is predominantly light gray.

Profile of Bonn silt loam. The location is 2½ miles west of State Highway 35 and Adams Arbor Church and 30 feet west of a gravel road, in the NE¼NE¼ sec. 19, T. 24 N., R. 2 E. Cultivated field, 1 percent slope.

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; massive to weak, fine, granular structure; friable; common fine roots; slightly acid; abrupt, smooth boundary.

B21tg—6 to 11 inches, light-gray (10YR 7/1) silt loam; common, medium, distinct mottles of brownish yellow (10YR 6/6) and olive yellow (2.5Y 6/6); weak to moderate, coarse, prismatic structure; friable to firm; few fine roots; few, fine, brown and black concretions; clay films on most peds; tongues of gray silt throughout horizon; mildly alkaline; clear, smooth boundary.

B22tg—11 to 30 inches, light brownish-gray (2.5Y 6/2) heavy silt loam; common, medium, distinct mottles of olive yellow (2.5Y 6/6) and yellowish brown (10YR 5/8); weak to moderate, coarse, prismatic structure breaking to moderate, medium, subangular blocky and angular blocky structure; friable to firm; many, fine to coarse, brown and black concretions; clay films on most peds; tongues of gray silt; moderately alkaline; clear, smooth boundary.

B23tg—30 to 48 inches, mottled gray (10YR 6/1), light brownish-gray (10YR 6/2), and strong-brown (7.5YR 5/6) silt loam; weak, coarse, angular blocky and subangular blocky structure; friable to firm; many, fine to coarse, brown and black concretions; patchy clay films; moderately alkaline; clear, smooth boundary.

B3g—48 to 60 inches, light-gray (10YR 7/1) silt loam; few, fine, distinct mottles of grayish brown and yellowish brown; structureless; friable; common, fine, brown and black concretions; moderately alkaline.

The Ap horizon is dark grayish brown, grayish brown, or gray. It ranges from 4 to 7 inches in thickness and from silt to heavy silt loam in texture.

The B horizon ranges from silt loam to silty clay loam in texture. It is 60 inches or more in thickness. In some profiles, the prisms have weakly expressed biscuit-shaped caps. The reaction ranges from medium acid to neutral in the Ap horizon and from neutral to mildly alkaline in the upper part of the B horizon. It increases to moderately alkaline within a depth of 30 inches.

Bonn soils occur in the eastern part of the delta. They are mapped only in a complex with Calhoun soils. They also occur with Rosebloom, Waverly, Falaya, Tippo, and Leverett soils. Bonn soils are similar to Calhoun and Rosebloom soils in internal drainage and range of clay content, but Bonn soils have a large amount of exchangeable sodium in the B horizon. They are more clayey and have a better developed B horizon than Waverly soils. Bonn soils are more poorly drained and finer textured than Falaya, Tippo, and Leverett soils, and they lack the fragipan of Tippo and Leverett soils.

Bruno Series

The Bruno series consists of nearly level, excessively drained, medium acid soils that formed in coarse-textured alluvium that was stratified with thin layers of medium-textured material.

In a typical profile, the surface layer is dark grayish-brown fine sandy loam about 5 inches thick. The underlying material, to a depth of 55 inches, consists of stratified layers of pale-brown silt loam and light yellowish-brown sand or gravelly loamy sand.

Profile of Bruno fine sandy loam. The location is 6 miles southwest of Charleston, Miss., and 600 feet north of Ascalmore Creek, in the SE¼NW¼ sec. 29, T. 24 N., R. 2 E. Cultivated field.

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; very friable; few fine roots; medium acid; abrupt, smooth boundary.

C1—5 to 10 inches, light yellowish-brown (10YR 6/4) sand; structureless; loose; few fine roots; medium acid; clear, smooth boundary.

C2—10 to 14 inches, pale-brown (10YR 6/3) silt loam; structureless; friable; few fine roots; medium acid; clear, smooth boundary.

C3—14 to 19 inches, light yellowish-brown (10YR 6/4) sand; structureless; medium acid; clear, wavy boundary.

C4—19 to 21 inches, light yellowish-brown (10YR 6/4) silt loam; structureless; medium acid; clear, smooth boundary.

C5—21 to 43 inches, light yellowish-brown (10YR 6/4) sand; structureless; medium acid; clear, smooth boundary.

C6—43 to 55 inches, mottled dark yellowish-brown (10YR 4/4), pale-brown (10YR 6/3), and light-gray (10YR 7/2) silt loam; structureless; medium acid.

The color of the Ap horizon is dark grayish brown to brown, and the texture of the Ap horizon is fine sandy loam, loamy sand, or sand. The color of the C horizon is light yellowish brown to dark brown. The texture of the C horizon ranges from sand to loamy sand and to stratified layers of sand and silt loam. Some profiles have grayish mottles in the lower part of the C horizon, and some have brown and gray mottles. Some profiles contain gravel. The reaction ranges from medium acid to slightly acid.

In Tallahatchie County, Bruno soils occur in undifferentiated groups with Crevasse soils and with Vicksburg soils and in a complex with Tutwiler soils. Bruno soils are finer textured than Crevasse soils and slightly coarser textured than Tutwiler soils.

Calhoun Series

The Calhoun series consists of nearly level, poorly drained soils that are strongly acid in the upper part of the profile and slightly acid at a depth of about 30 inches. These soils formed in silt loam or heavy silt loam (loessal) material, on flood plains and low terraces. The native vegetation consists of hardwoods, canes, and vines.

In a typical profile, the surface layer is dark grayish-brown silt loam, about 4 inches thick, and the subsurface layer, about 10 inches thick, is light brownish-gray silt loam. The subsoil, about 34 inches thick, is dominantly light brownish-gray, mottled heavy silt loam. Tongues of gray silt extend from the subsurface layer into the subsoil.

Profile of Calhoun silt loam. The location is in a cultivated field 4 miles west of Charleston, Miss., 3 miles south of State Highway 32, and 50 feet north of a gravel road in the NW¼NE¼ sec. 18, T. 24 N., R. 2 E.

Ap—0 to 4 inches, dark grayish-brown (10YR 4/2) silt loam; few, fine, faint mottles of grayish brown; weak, fine, granular structure; very friable; many fine and medium roots; medium acid; abrupt, wavy boundary.

A2g—4 to 14 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, distinct mottles of yellowish brown; weak, fine and medium, subangular and angular blocky structure; friable; many fine roots; few, fine, brown and black concretions; strongly acid; tongues of gray silt extend into B21tg horizon; clear, wavy boundary.

B21tg—14 to 30 inches, light brownish-gray (2.5Y 6/2) heavy silt loam; common, medium, distinct mottles of dark yellowish brown and yellowish brown; moderate, medium, subangular and angular blocky structure grading to slightly prismatic; friable to firm; fine brown concretions; thin clay films on peds; strongly acid; gradual, wavy boundary.

B22tg—30 to 48 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, distinct mottles of yellowish brown; weak to moderate, medium, subangular blocky structure breaking to weak, fine, prismatic; friable to firm; clay films on peds; common brown and black concretions; slightly acid.

The color of the Ap horizon is dark grayish brown to gray. The A horizon ranges from 12 to 20 inches in thickness and from silt to heavy silt loam in texture. The matrix color of the B horizon ranges from light brownish gray to gray. Mottles are in shades of yellow and brown. The B horizon is silt loam or heavy silt loam in texture and ranges up to 60 inches or more in thickness. Tongues of gray silt extend into the B horizon. Brown and black concretions are few to common throughout the profile. The reaction ranges from medium acid to strongly acid in the Ap horizon and from strongly acid to very strongly acid in the upper part of the B horizon.

Calhoun soils occur in the eastern part of the delta with Bonn, Rosebloom, Waverly, Falaya, Tippo, and Leverett soils. Calhoun soils lack the sodium horizons that are typical of Bonn soils. They are less acid in the surface layer than Rosebloom soils, which lack a B horizon. Calhoun soils have better profile development and are more clayey than Waverly and Falaya soils. They are more poorly drained and more clayey than Tippo and Leverett soils, and they lack a fragipan.

Calhoun soils also occur as small areas throughout the uplands in the eastern part of the county, with Calloway, Grenada, Loring, and Memphis soils. Calhoun soils are more poorly drained than Calloway, Grenada, and Loring soils, and they lack a fragipan. They are less well drained than Memphis soils and are dominantly gray throughout the upper 30 inches of the solum.

Calhoun silt loam (0 to 2 percent slopes) (Ca).—This soil occurs in small depressions and at the head of drains throughout the loessal uplands in the eastern part of the county. It has the profile described as typical of the series. Included in the areas mapped are small areas of soils that lack the vertical tongues into the B horizons and that become neutral or mildly alkaline at a depth of about 30 inches.

The natural fertility is moderate. Permeability is slow. The available water capacity is moderate. Tilth is fair to poor. Tillage operations are delayed in spring because of wetness. Runoff is slow, and the erosion hazard is slight.

Most of this soil is cultivated or used for pasture. The principal crops are small grain, soybeans, cotton, and corn. (Capability unit IIIw–3; woodland suitability group 11)

Calhoun-Bonn complex (0 to 2 percent slopes) (Cb).—This complex is in the eastern part of the delta. Each area is about 65 percent Calhoun soil and 35 percent Bonn soil.

The Calhoun soil in this complex has a surface layer of dark grayish-brown silt loam about 4 inches thick. The subsoil is light brownish-gray silt loam and heavy silt loam. The reaction is strongly acid to a depth of about 30 inches and slightly acid below that depth.

The Bonn soil has a surface layer of dark grayish-brown silt loam about 6 inches thick. The subsoil is light-gray and light brownish-gray silt loam that is high in exchangeable sodium.

Included in the areas mapped are small areas of poorly drained Waverly soils. Also included are soils that are like the Calhoun soil except that they become neutral or mildly alkaline at a depth of about 30 inches.

The natural fertility is moderate. Permeability is moderate to slow. The available water capacity is generally moderate during the crop-growing season. These soils are somewhat difficult to work because they are dry and hard during the crop-growing season. The water table is high in winter. Tillage operations are delayed in spring because of excessive wetness. Runoff is slow, and the erosion hazard is slight.

Most of the acreage is cleared and used for crops and pasture. A small amount is woodland. The open land is used to produce cotton, soybeans, small grain, rice, and pasture. The high sodium content of the Bonn soil is a limitation. Drainage is needed to remove excess

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surface water. (Capability unit IIIw–3; woodland suitability group 11)

Calloway Series

The Calloway series consists of nearly level, somewhat poorly drained, acid soils that formed on uplands in thick beds of silty material. The native vegetation consists of upland hardwoods and shortleaf pine.

This soil has a surface layer of light brownish-gray silt loam about 6 inches thick. In places an A2 horizon of brown silt loam is present. The upper 9 inches of the subsoil is light yellowish-brown or yellowish-brown, mottled silt loam. Just below this is a 4- to 6-inch layer of pale-brown to gray or brownish-gray silt loam, and below this, a fragipan of gray and brown silty clay loam to heavy silt loam.

These soils are used mostly for crops and pasture.

Profile of Calloway silt loam, 0 to 3 percent slopes. The location is 4.75 miles northeast of Charleston, Miss., 0.25 mile north of Little Creek, and 100 feet south of woods, in the SW¼SE¼ sec. 5, T. 25 N., R. 3 E. Cultivated field, 3 percent slope.

Ap—0 to 6 inches, light brownish-gray (10YR 6/2) silt loam; weak, fine, granular structure; friable; few fine roots; few, fine and medium, black concretions; strongly acid; abrupt, smooth boundary.

A2—6 to 9 inches, brown (10YR 5/3) silt loam; weak platy structure breaking to weak, medium, subangular blocky; friable; few fine roots; few, fine, black concretions; slightly compact; strongly acid; abrupt, smooth boundary.

B2—9 to 18 inches, light yellowish-brown (10YR 6/4) silt loam; few, fine, distinct mottles of light brownish gray and pale brown; weak to moderate, medium and fine, subangular blocky structure; friable; few fine roots; few brown and black concretions; strongly acid; abrupt, smooth boundary.

A'2—18 to 24 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, faint mottles of gray and light brownish gray; weak to moderate, medium, subangular blocky structure; compact and brittle; few voids; silt coatings on peds; few, fine, brown concretions; strongly acid; clear, smooth boundary.

B'x1—24 to 37 inches, mottled grayish-brown (10YR 5/2) gray (10YR 7/1), and dark-brown (7.5YR 4/4) silty clay loam; moderate, medium and coarse, subangular blocky structure; compact and brittle; gray silt in polygonal cracks and on some peds; patchy clay films on peds; strongly acid; few concretions; clear, smooth boundary.

B'x2—37 to 52 inches, mottled dark yellowish-brown (10YR 4/4), light-gray (10YR 7/1), and light brownish-gray (10YR 6/2) heavy silt loam; weak, medium, subangular blocky structure; compact and brittle; few patchy clay films; gray silt in polygonal cracks and on some peds; few, fine, brown and black concretions; strongly acid; gradual, smooth boundary.

B'x3—52 to 60 inches, dark-brown (10YR 3/3) silt loam; many, coarse, distinct mottles of light gray (10YR 7/1) and light brownish gray (10YR 6/2); weak, medium, subangular blocky structure; slightly compact and brittle; gray silt in polygonal cracks and on some peds; few, fine, brown and black concretions; strongly acid.

The color of the Ap horizon is light brownish gray, pale brown, or brown. The color in the uppermost 9 inches of the subsoil is dominantly pale brown or light yellowish brown. The layer immediately above the fragipan is pale-brown to light brownish-gray silt loam. The fragipan is heavy silt loam to silty clay loam. The content of black and brown concretions ranges from few to common.

Calloway soils occur in small areas throughout the uplands, with Memphis, Loring, Grenada, and Calhoun soils. They are not so well drained as Memphis, Loring, and Grenada soils, and they lack the clay films that are in the upper part of the B horizon of Memphis and Loring soils. They differ from Grenada soils in that they have mottles in the uppermost 9 inches of the B horizon. Calloway soils are better drained than Calhoun soils.

Calloway silt loam, 0 to 3 percent slopes (CIA).—This soil occurs near or adjoining flood plains, but at a higher elevation, in the eastern part of the county. Included in the areas mapped are small areas of Grenada soils, which occur as long narrow bands, and of Calhoun soils, which are in shallow depressions. Also included are small areas that have slopes of as much as 4 percent.

The natural fertility is moderate, and the available water capacity is moderate to low. Permeability is moderate above the fragipan but slow to moderately slow in the fragipan. Tilth is good, but cultivation may be delayed in spring because of wetness. Runoff is slow to medium, and the erosion hazard is slight to moderate if the soils are cultivated.

Approximately 85 percent of this soil is cultivated or used for pasture, and the rest is woodland. Cotton, soybeans, small grain, pasture plants, and trees are well suited. (Capability unit IIw–4; woodland suitability group 7)

Cascilla Series

The Cascilla series consists of nearly level, well-drained, acid soils that formed in silty (loessal) material. These soils occur on colluvial fans adjacent to the bluff hills and along streams, in the eastern part of the delta. The native vegetation consists of mixed hardwoods, canes, and vines.

In a typical profile, the surface layer is brown silt loam about 6 inches thick. The subsoil is dark-brown silt loam to a depth of about 46 inches.

Profile of Cascilla silt loam, 0 to 3 percent slopes. The location is 4 miles south of Charleston, Miss., and 300 feet west of Adams Arbor Church, in the SE¼SW¼ sec. 15, T. 24 N., R. 2 E. Cultivated field.

Ap—0 to 6 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; many fine and medium roots; medium acid; abrupt, smooth boundary.

B21—6 to 16 inches, dark-brown (10YR 4/3) silt loam; weak, fine and medium, subangular blocky structure; friable; few worm casts; few fine roots; few patchy clay films on peds; few thin silt coatings; strongly acid; clear, smooth boundary.

B22—16 to 28 inches, dark-brown (7.5YR 4/4) silt loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; common pale-brown silt coatings; strongly acid; clear, smooth boundary.

B3—28 to 46 inches, dark-brown (10YR 3/3) silt loam; weak, fine and medium, subangular blocky structure; friable; strongly acid; few, fine, black concretions.

The color of the Ap horizon is brown or yellowish brown. In places the surface is covered with an overwash of sandy loam, gravelly sandy loam, or loamy sand. The color of the B horizon is dark brown to dark yellowish brown. The texture of the B horizon is dominantly silt loam but ranges to loam. The clay content is 18 to 20 percent, and the silt content is generally more than 50 percent. Less than 15 percent of the sand is coarser than very fine sand.

Cascilla soils are associated with Vicksburg, Collins, Fa-

laya, Tutwiler, and Bruno soils. Cascilla soils have a B horizon, which Vicksburg, Collins, and Falaya soils lack. They lack the bedding planes that are typical of Vicksburg and Collins soils. Cascilla soils are better drained than Collins and Falaya soils, are more clayey than Tutwiler soils, and are more silty than Bruno soils.

Cascilla silt loam, 0 to 3 percent slopes (CmA).—This soil occurs on colluvial fans adjacent to the bluff hills and along creeks, in the eastern part of the county. The surface layer is eroded in a few spots. Included in the areas mapped are small areas of coarser textured Tutwiler soils.

This soil has good tilth, and it can be cultivated throughout a wide range of moisture content without clodding. The natural fertility is moderate. Permeability is moderate, and the available water capacity is high. Runoff is slow, and the erosion hazard is slight.

Most of the acreage is cultivated or used for pasture. Cotton, soybeans, corn, small grain, and pasture plants are suitable crops. (Capability unit I–2; woodland suitability group 13)

Collins Series

The Collins series consists of nearly level, moderately well drained, acid soils that formed in silty material on flood plains and in upland drainageways. The native vegetation consists of mixed hardwoods.

In a typical profile, the surface layer is brown silt loam about 7 inches thick. The underlying material, to a depth of 23 inches, is yellowish-brown to dark-brown silt loam mottled with light brownish gray below a depth of 14 inches. Below this is silt loam mottled with shades of gray and brown. Small areas are underlain with gray clay at a depth of 18 to 30 inches.

Most of this soil has been cleared and is used for crops and pasture. A small acreage is in hardwoods.

Profile of Collins silt loam. The location is 4 miles north of Charleston, Miss., on Teasdale Highway, 150 feet north of Mitchell Creek bridge, and 100 feet east of the highway, in the SW¼NE¼ sec. 12, T. 25 N., R. 2 E. Cultivated field, 1 percent slope.

Ap—0 to 7 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; abrupt, smooth boundary.

C1—7 to 14 inches, yellowish-brown (10YR 5/4) silt loam; structureless; thin bedding planes; slightly compact; friable; many fine roots; few worm casts; strongly acid; clear, smooth boundary.

C2—14 to 23 inches, dark-brown (10YR 4/3) silt loam; few, coarse, distinct mottles of light brownish gray; structureless; thin bedding planes; friable; few fine roots; few worm casts; few pale-brown stratifications; strongly acid; clear, smooth boundary.

C3—23 to 31 inches, mottled pale-brown (10YR 6/3), dark yellowish-brown (10YR 4/4), and light-gray (10YR 7/2) silt loam; structureless; thin bedding planes, weakly expressed; friable; few fine roots in upper horizon; common, fine, brown concretions; strongly acid; gradual, smooth boundary.

C4g—31 to 48 inches, light brownish-gray (10YR 6/2) silt loam; many, coarse, distinct mottles of light yellowish brown (10YR 5/4) and pale brown (10YR 6/3); structureless; friable; many, fine, brown to reddish-brown concretions; strongly acid.

The color of the Ap horizon is brown or yellowish brown. Small areas have an overwash of sandy loam. Some profiles have few to many brown and black concretions or dark-brown stains, and some contain a few quartz pebbles. The texture throughout the profile ranges from silt loam to silt. The reaction ranges from medium acid to strongly acid.

Collins soils occur throughout the flood plains in the eastern part of the county, with Vicksburg, Falaya, Waverly, Leverett, and Tippo soils. Collins soils are not so well drained as Vicksburg soils. They are better drained than Falaya, Tippo, and Waverly soils. They lack a B horizon, which both Leverett and Tippo soils have.

Collins silt loam (0 to 2 percent slopes) (Cn).—This soil occurs on flood plains and in upland drainageways in the eastern part of the county. It has the profile described as typical of the series. Included in the areas mapped are small areas of well-drained Vicksburg soils, which are adjacent to streams, and of Falaya soils, which are in lower areas.

The natural fertility is moderate. Permeability is moderate. The available water capacity is high. Tilth is easily maintained, and the soil can be cultivated throughout a moderate range of moisture content without clodding. Runoff is slow, and there is little or no erosion.

This soil is used mostly for row crops and pasture. It is suited to intensive cultivation but needs surface drainage and protection from floods. The floods do not occur during the growing season and consequently do little damage to row crops. Cotton, corn, soybeans, small grain, and pasture plants are suitable crops. A small acreage is in mixed hardwoods. (Capability unit I–2; woodland suitability group 8)

Collins silt loam, clayey subsoil variant (0 to 2 percent slopes) (Co).—This soil occurs along Ascalmore Creek in the eastern part of the delta. Included in the areas mapped are small recent deposits of silt, 12 inches thick, over older clayey alluvium.

This soil has a surface layer of yellowish-brown silt loam about 4 inches thick. The upper 25 inches of the underlying material is yellowish-brown and pale-brown silt loam mottled with light brownish gray at a depth of about 19 inches. Bedding planes are prominent. The lower part of the subsoil is gray silty clay to clay.

The natural fertility is moderate. Permeability is moderate above the clayey layer and slow in the clayey layer. The available water capacity is high. Runoff is slow, and there is little or no risk of erosion.

Most of this soil is used for row crops or pasture. Cotton, soybeans, small grain, and corn are the principal row crops. Surface drainage and protection from floods are needed. Floods generally do not occur during the growing season. (Capability unit IIw–3; woodland suitability group 8)

Crevasse Series

The Crevasse series consists of nearly level, excessively drained, nonacid soils that formed in coarse-textured alluvium. These soils occur along stream channels in the eastern part of the delta.

In a typical profile, the surface layer is brown sand, about 4 inches thick, and the underlying material, to a depth of 48 inches, is yellowish-brown and light yellowish-brown sand.

Profile of Crevasse sand. The location is 6 miles southwest of Charleston, Miss., and 300 feet north of Ascalmore Creek, in the SE¼NW¼ sec. 29, T. 24 N., R. 2 E.

Ap—0 to 4 inches, brown (10YR 5/3) sand; weak, fine, granular structure; friable; few fine roots; medium acid; abrupt, smooth boundary.
C1—4 to 7 inches, yellowish-brown (10YR 5/4) sand; structureless; loose; few fine roots; slightly acid; gradual, smooth boundary.
C2—7 to 48 inches, light yellowish-brown (10YR 6/4) sand; structureless; slightly acid.

The color of the Ap horizon is brown to grayish brown and yellowish brown. The texture is sand or loamy sand. The color of the C horizon is dominantly yellowish brown. The texture is dominantly sand but ranges to loamy sand and includes some thin layers of silt. In some places, there is a little gravel on the surface. The reaction ranges from neutral to medium acid.

Crevasse soils are associated with Bruno, Cascilla, Tutwiler, Collins, and Falaya soils. Crevasse soils are less than 10 percent silt and clay, whereas Bruno soils are 10 to 25 percent silt. Crevasse soils are better drained and coarser textured than Cascilla, Tutwiler, Collins, and Falaya soils.

Crevasse and Bruno soils (0 to 2 percent slopes) (Cs).—These soils occur where stream channels have filled and spread out. Some areas consist of Crevasse soil, some of Bruno soil, and some of both.

The Crevasse soil occupies about 45 to 60 percent of each area mapped. It has the profile described as typical for the series.

The Bruno soil occupies about 35 to 50 percent of each area. It has a surface layer of dark grayish-brown fine sandy loam about 5 inches thick. The underlying material consists of stratified light yellowish-brown and pale-brown sand and silt loam to a depth of about 55 inches.

Included in the areas mapped are small areas of Falaya, Bruno, and Crevasse soils. A few areas contain gravel.

The soils in this unit are medium acid to slightly acid. The natural fertility is low. Permeability is rapid. The available water capacity is low. There is little runoff and almost no hazard of erosion.

These soils are used mostly for pasture plants, small grain, soybeans, and cottonwood trees. A small acreage is idle or overgrown with willows. (Capability unit: Crevasse IVs–1, Bruno IIIw–5. Woodland suitability group 16)

Dubbs Series

The Dubbs series consists of nearly level to gently sloping, well drained to moderately well drained, acid soils. These soils formed in loamy alluvium on old natural levees that border former channels of the Mississippi River and its tributaries. The native vegetation consists of mixed hardwoods, canes, and vines.

In a typical profile, the surface layer is dark grayish-brown very fine sandy loam about 5 inches thick. The upper part of the subsoil, to a depth of 23 inches, is yellowish-brown silty clay loam. The lower part, to a depth of about 50 inches, is yellowish-brown, mottled loam.

Profile of Dubbs very fine sandy loam, 2 to 5 percent slopes. The location is 3 miles north of Sumner, Miss., and 0.6 mile west of New Salem Church, in the SE¼-SW¼ sec. 24, T. 25 N., R. 2 W. Cultivated field, 2.5 percent slopes.

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) very fine sandy loam; weak, fine, granular structure; many fine roots; very friable; very strongly acid; abrupt, smooth boundary.
B21t—5 to 23 inches, yellowish-brown (10YR 5/4) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; slightly plastic; fine roots; clay films continuous on ped faces; few, fine, black concretions; very strongly acid; clear, smooth boundary.
B22t—23 to 40 inches, yellowish-brown (10YR 5/4) loam; few, fine, distinct, light-gray and light brownish-gray mottles; weak to moderate, fine and medium, subangular blocky structure; friable; few fine roots; patchy clay films continuous on ped faces; few, fine, black concretions; strongly acid; clear, smooth boundary.
B3—40 to 50 inches, yellowish-brown (10YR 5/4) loam; common, medium, distinct, light-gray (10YR 6/1) and light brownish-gray (10YR 6/2) mottles; weak, medium, subangular blocky structure; friable; few, fine, black concretions; very strongly acid.

The color of the Ap horizon is dark grayish brown to brown. The thickness ranges from 5 to 8 inches. The color of the B horizon is dominantly yellowish brown or dark yellowish brown but ranges to dark brown. The texture of the B2t horizon ranges through silty clay loam, silt loam, and loam to sandy clay loam. There are no gray mottles in the uppermost 10 inches of the B horizon. The texture of the B3 horizon ranges from silt loam to very fine sandy loam. The C horizon, which is generally at a depth greater than 50 inches, is very fine sandy loam and is similar to the B horizon in color. The reaction of the soil ranges from medium acid to very strongly acid through the profile.

Dubbs soils occur in the western part of the county, with Tutwiler, Dundee, Tensas, and Forestdale soils. They are less well drained than Tutwiler soils and better drained than Dundee soils. They are better drained and coarser textured than Tensas and Forestdale soils. Dubbs soils also occur at higher elevations than Dundee, Tensas, and Forestdale soils.

Dubbs very fine sandy loam, 0 to 2 percent slopes (DbA).—This soil occurs on old natural levees in the western part of the county. Included in the areas mapped are poorly drained Forestdale soils in depressions. Also included are small areas of coarser textured Tutwiler soils on high ridges. The surface layer of about 40 percent of the mapping unit is silt loam.

This soil commonly has a dark grayish-brown surface layer about 5 inches thick. The upper part of the subsoil, about 18 inches thick, is yellowish-brown silty clay loam. It is underlain at a depth of about 23 inches by yellowish-brown loam mottled with gray.

This soil has good tilth and can be cultivated throughout a wide range of moisture content without clodding. Natural fertility is moderate. Permeability is moderate to moderately slow, and the available water capacity is moderate. Runoff is slow, and the erosion hazard is slight.

Most of this soil is cultivated or used for pasture. Cotton, corn, soybeans, small grain, and pasture plants are suitable crops. (Capability unit I–3; woodland suitability group 4)

Dubbs very fine sandy loam, 2 to 5 percent slopes (DbB).—This soil occurs on narrow ridges or long narrow surfaces adjacent to former or present stream channels, in the western part of the county. It has the profile described as typical of the series. Included in the areas mapped are some nearly level areas and some small eroded areas. The surface layer of about 25 percent of the mapping unit is silt loam.

The available water capacity is moderate. Permeability is moderate to moderately slow. Cotton, corn, soybeans, and small grain are suitable crops. Crop rows should be designed to conserve moisture and to control erosion. (Capability unit IIe–1; woodland suitability group 4)

Dundee Series

The Dundee series consists of nearly level to sloping, somewhat poorly drained, strongly acid soils that formed on old natural levees or low terraces bordering former channels of the Mississippi River and its tributaries. The native vegetation consists of mixed hardwoods, canes, and vines.

In a typical profile, the surface layer is dark grayish-brown silt loam about 7 inches thick. The subsoil is dark grayish-brown silty clay loam in the uppermost part, mottled light brownish-gray and yellowish-brown silt loam in the middle part, and mottled light brownish-gray silt loam below a depth of about 28 inches.

Profile of Dundee silt loam, 0 to 2 percent slopes. The location is 0.2 mile north of the junction of State Highways 32 and 321, and 200 feet east of Highway 321, in the NW¼NW¼ sec. 17, T. 24 N., R. 1 W. Cultivated field.

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; many fine roots; strongly acid; abrupt, smooth boundary.

B21t—7 to 15 inches, dark grayish-brown (10YR 4/2) silty clay loam; moderate, medium, subangular blocky structure; slightly plastic; friable; few fine roots; clay films continuous on ped faces; strongly acid; abrupt, smooth boundary.

B22tg—15 to 28 inches, mottled grayish-brown (10YR 5/2), light brownish-gray (10YR 6/2), and yellowish-brown (10YR 5/4) heavy silt loam; moderate, medium, subangular blocky structure; friable; few clay films on peds; few fine roots; few, fine, black concretions; strongly acid; clear, smooth boundary.

B3g—28 to 50 inches, light brownish-gray (10YR 6/2) heavy silt loam; common, medium, distinct mottles of dark yellowish brown; weak, fine, subangular blocky structure; friable; many, fine, brown and black concretions; strongly acid.

The color of the Ap horizon is dark grayish brown, grayish brown, or brown. The Ap horizon ranges from 4 to 7 inches in thickness and from silt loam to silty clay loam in texture. The B horizon ranges from dark grayish brown to light brownish gray in color and is mottled with shades of gray and brown. The texture of the B2t horizon is mainly silty clay loam and heavy silt loam but ranges to clay loam. The B2t horizon is 15 to 28 inches thick. The reaction of the B horizon ranges from medium acid to very strongly acid. The B3g horizon is loam to silt loam in texture. In some profiles, there is a IIC horizon of very fine sandy loam, loamy sand, or clay.

Dundee soils occur in the western part of the county, with Tutwiler, Dubbs, Forestdale, and Tensas soils. Dundee soils are more poorly drained and occur at slightly lower elevations than Tutwiler and Dubbs soils. They are better drained, have a less clayey subsoil, and occur at higher elevations than Tensas and Forestdale soils.

Dundee silt loam, 0 to 2 percent slopes (DdA).—This soil occurs on old natural levees in the western part of the county. It has the profile described as typical of the series. Included in the areas mapped are small areas in which the upper part of the subsoil is browner and is mottled with gray.

This soil has good tilth, and it can be cultivated throughout a moderate range of moisture content without clodding. The natural fertility is moderate. Permeability is moderately slow. The available water capacity is moderate. Runoff is slow, and the erosion hazard is slight.

Most of the acreage is cultivated or used for pasture. Cotton, corn, soybeans, small grain, and pasture plants are suitable crops. (Capability unit I–3; woodland suitability group 5)

Dundee silt loam, 2 to 5 percent slopes (DdB).—This soil occurs on old natural levees in the western part of the county. Included in the areas mapped are small areas of Dubbs soil. Also included are some areas in which the upper part of the subsoil is browner and is mottled with gray. The surface layer is eroded in a few areas, and in some places it is very fine sandy loam.

This soil has a dark grayish-brown surface layer about 5 inches thick. The subsoil is dark grayish-brown silty clay loam mottled with light brownish gray. At a depth of about 26 inches is light brownish-gray silt loam.

The natural fertility is moderate, and the available water capacity is moderate. Permeability is moderately slow. Runoff is slow, and the erosion hazard is slight.

Most of the acreage is cultivated or is used for pasture. Cotton, corn, soybeans, small grain, and pasture plants are suitable crops. Rows should be so arranged as to conserve moisture and to control erosion. (Capability unit IIe–1; woodland suitability group 5)

Dundee silty clay loam, 0 to 2 percent slopes (DeA).—This soil occurs on natural levees or low terraces in the western part of the county. Included in the areas mapped are small areas of poorly drained Forestdale silt loam in depressions.

This soil has a surface layer of dark grayish-brown silty clay loam about 5 inches thick. The subsoil, to a depth of about 30 inches, is dark grayish-brown silty clay loam. Below a depth of about 30 inches, it is light brownish-gray silt loam.

This soil can be cultivated only within a narrow range of moisture content without clodding and crusting. Permeability is moderately slow. The available water capacity and natural fertility are moderate. Because of the silty clay loam surface layer, ponding occurs after heavy rains and spring cultivation is delayed slightly. Runoff is moderate, and the erosion hazard is slight.

Most of the acreage is cultivated or is used for pasture. Cotton, corn, soybeans, small grain, and pasture plants are suitable crops. (Capability unit IIw–1; woodland suitability group 5)

Dundee silty clay loam, 2 to 5 percent slopes (DeB).—This soil occurs on natural levees or low terraces in the western part of the county. A few small eroded areas are included.

This soil has a surface layer of dark grayish-brown silty clay loam about 4 inches thick. The subsoil is dark grayish-brown silty clay loam mottled with grayish brown. Below a depth of about 28 inches, it is light brownish-gray silt loam.

This soil can be cultivated without clodding only within a narrow range of moisture content. Permeability is moderately slow. The available water capacity and the natural fertility are moderate.

Most of this soil is cultivated. Cotton, corn, soybeans, small grain, and pasture plants are suitable crops. Rows should be so arranged as to remove surface water and to control erosion. (Capability unit IIe–4; woodland suitability group 5)

Dundee soils, 5 to 8 percent slopes (DnC).—These soils occur as long, narrow, sloping bands along depressions and drainageways in the western part of the county.

Included in the areas mapped are small areas of well-drained Dubbs soils. Also included are a few eroded areas.

These Dundee soils have a surface layer of dark grayish-brown silt loam, very fine sandy loam, or silty clay loam about 4 inches thick. The upper part of the subsoil, about 24 inches thick, is brown heavy silt loam mottled with grayish brown. It is underlain at a depth of about 30 inches by very fine sandy loam.

Permeability is moderately slow. The available water capacity and the natural fertility are moderate. Runoff is medium to moderately rapid, and the erosion hazard is slight to moderate.

Most of the acreage is used for pasture or crops. Cotton, corn, soybeans, small grain, and pasture plants are suitable crops. Row crops should be grown only in rotations in which small grain, pasture, or hay is grown at least half of the time. Crop rows should be on the contour so as to conserve moisture and remove excess surface water without causing erosion. (Capability unit IIIe–3; woodland suitability group 5)

Dundee and Tensas silt loams, 0 to 3 percent slopes (DtA).—These soils occur in the western part of the county. They are mapped together as an undifferentiated unit. Some areas consist of Dundee silt loam, some of Tensas silt loam, and some of a combination of the two.

The Dundee soil occupies about 30 to 60 percent of the mapped areas. It has a surface layer of dark grayish-brown silt loam about 6 inches thick. The upper part of the subsoil is dark grayish-brown and grayish-brown silty clay loam. It is underlain at a depth of about 23 inches by light brownish-gray silt loam.

The Tensas soil occupies about 25 to 50 percent of the mapped areas. It has a surface layer of dark grayish-brown silt loam about 5 inches thick. The upper part of the subsoil is predominantly grayish-brown silty clay. It is underlain at a depth of about 28 inches by grayish-brown silty clay loam.

Included in the areas mapped are small low areas of poorly drained Forestdale soils, which are grayer in color. Also included is a poorly drained, grayer, less clayey soil.

The soils in this unit have fairly good tilth and can be cultivated throughout a moderate range of moisture content without clodding. The natural fertility is moderate. Permeability is moderately slow to slow. The available water capacity is moderate to high. Drainage is needed to remove excess surface water. Runoff is medium to slow, and the erosion hazard is slight.

Most of the acreage is used for crops and pasture. Soybeans, cotton, small grain, corn, rice, grasses, and legumes are suitable crops. (Capability unit: Tensas IIw–1, Dundee I–3. Woodland suitability group 5)

Falaya Series

The Falaya series consists of level to nearly level, somewhat poorly drained, acid soils that formed in silty local alluvium. The native vegetation consists of mixed hardwoods, canes, and vines.

In a typical profile, the surface layer is brown silt loam about 7 inches thick. Below this is a 10-inch layer of brown silt loam mottled with gray. This is underlain by mottled light-gray, pale-brown, and brown silt loam.

Profile of Falaya silt loam. The location is 0.75 mile north of Tillatoba Creek, 50 feet east of a field road, and 3 miles west of Charleston, Miss., in the NE¼NE¼ sec. 30, T. 25 N., R. 2 E. Cultivated field, 1 percent slope.

Ap—0 to 7 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; few fine and medium roots; medium acid; abrupt, smooth boundary.

C1—7 to 17 inches, brown (10YR 4/3) silt loam; common, medium, distinct mottles of light gray and pale brown; weak, medium, subangular blocky structure to structureless; friable; few fine roots; very strongly acid; clear, smooth boundary.

C2g—17 to 32 inches, mottled light-gray (10YR 7/2), pale-brown (10YR 6/3), and brown (10YR 4/3) silt loam; weak, medium, subangular blocky structure; friable; few, fine, brown and black concretions; very strongly acid; clear, smooth boundary.

C3g—32 to 46 inches, gray (10YR 5/1) silt loam; common, medium, distinct mottles of dark yellowish brown; weak, medium, subangular blocky structure; friable; common, dark-brown stains; common, fine to medium, brown and black concretions; very strongly acid; clear, smooth boundary.

C4g—46 to 54 inches, gray (10YR 6/1) silt loam; few, medium, distinct mottles of dark yellowish brown and very pale brown; structureless; friable; few, fine, brown and black concretions; very strongly acid.

The color of the Ap horizon is brown, dark grayish brown, or grayish brown. The thickness of the Ap horizon ranges from 5 to 8 inches, and the texture ranges from silt loam to silty clay loam. The upper part of the C horizon either has a matrix color of brown to yellowish-brown and grayish mottles or has a matrix color that ranges to light brownish gray and gray. The lower part of the C horizon is dominantly gray but is distinctly mottled with shades of gray, yellowish brown, and brown. The texture of the C horizon ranges from silt loam to silt.

Some profiles contain few to many, fine to medium, brown and black concretions, and some contain a few quartz pebbles. The reaction ranges from very strongly acid to medium acid.

Falaya soils occur on flood plains in the eastern part of the county, with Collins, Waverly, Leverett, Tippo, Calhoun, and Bonn soils. Falaya soils lack the sodium horizon of Bonn soils and the texural B horizon of Calhoun, Bonn, Leverett, and Tippo soils. They are less gray than Waverly soils.

Falaya silt loam (0 to 2 percent slopes) (Fa).—This soil occurs in the eastern part of the county. It has the profile described as typical of the series. Included in the areas mapped are small areas of moderately well drained Collins soils, which make up less than 5 percent of the unit. Also, about 5 percent of the unit has a silty clay loam surface layer.

The natural fertility is moderate, and permeability is moderate. The available water capacity is moderate to high. A plowpan forms readily in cultivated areas. Drainage is needed to remove excess surface water.

Most of this soil is used for crops and pasture. Cotton, soybeans, small grain, corn, and pasture plants are suitable crops. (Capability unit IIw–3; woodland suitability group 9)

Falaya-Waverly association (0 to 2 percent slopes) (Fe).—This association occurs in large wooded areas in the eastern part of the delta. It lacks drainage outlets and remains flooded for periods of 2 to 3 months each year. It was mapped by transects, in which 81 soil observations were made for 5,720 acres. The soils occur in a regular pattern but, because of inaccessibility, were mapped as an association rather than as separate units.

The Falaya soil occupies about 41 percent of the as-

sociation. It has a surface layer of dark grayish-brown silt loam about 6 inches thick. The next layer is dark yellowish-brown silt loam. It is underlain at a depth of about 11 inches by brown silt loam mottled with gray. The material below a depth of 20 inches is predominantly gray silt loam.

The Waverly soil occupies about 37 percent of the association and occurs at slightly lower elevations than the Falaya soil. It has a surface layer of grayish-brown silt loam, about 4 inches thick, over predominantly gray silt loam.

The minor soils of the association are poorly drained Rosebloom soils, about 10 percent; poorly drained Bonn soils, which have horizons high in sodium, about 5 percent; poorly drained Calhoun soils, about 5 percent; and moderately well drained Collins soils, about 2 percent.

The natural fertility is moderate to low. Permeability is moderate. The available water capacity is moderate to high. Runoff is medium to slow, and there is no erosion.

All of this association is woodland. The soils are well suited to mixed hardwoods and pasture. If drained to remove excess surface water, they would be well suited to row crops. (Capability unit: Waverly IVw–2, Falaya IIw–3. Woodland suitability group: Waverly 15, Falaya 9)

Forestdale Series

The Forestdale series consists of nearly level, poorly drained, strongly acid soils that formed in fine textured to moderately fine textured Mississippi River alluvium. The native vegetation consists of mixed stands of hardwoods, canes, and vines.

In a typical profile, the surface layer is dark grayish-brown silty clay loam or silt loam about 6 inches thick. The upper 20 inches of the subsoil is light-gray, mottled silty clay, and the lower 18 inches is light-gray, mottled silty clay loam.

Profile of Forestdale silty clay loam, 0 to 3 percent slopes. The location is about 1.25 miles north of Brazil, Miss., and 0.25 mile east of State Highway 321, in the SW¼SW¼ sec. 11, T. 25 N., R. 1 W. Cultivated field, 0 to 3 percent slopes.

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silty clay loam; weak, fine, granular structure; friable; few fine roots; medium acid; abrupt, smooth boundary.

B2tg—6 to 26 inches, light-gray (10YR 6/1) silty clay; few, medium, distinct mottles of yellowish brown and dark yellowish brown; moderate, medium, subangular blocky structure; plastic and sticky; firm; few fine roots; clay films on ped faces; strongly acid; clear, smooth boundary.

B3g—26 to 44 inches, light-gray (10YR 6/1) silty clay loam; common, medium, distinct mottles of yellowish brown (10YR 5/6); weak, medium, subangular blocky structure; friable to firm; slightly plastic; patchy clay films on peds; strongly acid.

The color of the Ap horizon is dark grayish brown, gray, or grayish brown. The thickness of the Ap horizon ranges from 5 to 9 inches, and the texture ranges from silt loam to silty clay loam. The color of the B horizon is dominantly light gray to light brownish gray mottled with shades of brown or dark gray. The texture of the B2 horizon is commonly silty clay but ranges to silty clay loam. The texture of the B3 horizon ranges from silty clay loam to silt loam. The reaction ranges from medium acid to very strongly acid throughout the profile. Brown and black concretions range from none to common.

Forestdale soils occur throughout the western part of the county, with Alligator, Tensas, and Dundee soils. Forestdale soils are less clayey than Alligator soils and occur on old natural levees. They are grayer than Tensas soils. Forestdale soils are more poorly drained than Dundee soils and are more clayey.

Forestdale silt loam, depressional (0 to 3 percent slopes) (Fo).—This soil occurs in long, narrow, shallow depressions throughout the western part of the county, mainly with Dubbs and Dundee soils, which are at higher elevations. Included in the areas mapped are areas of Alligator silty clay loam, which make up less than 10 percent of the mapping unit.

Material from surrounding areas accumulates on this soil. The surface layer is dark grayish-brown silt loam, about 8 inches thick, over dark-gray to light brownish-gray silty clay loam about 10 inches thick. The subsoil, about 20 inches thick, is light-gray silty clay. It is underlain at a depth of about 38 inches by gray heavy silt loam.

The natural fertility is moderate. Permeability is slow. The available water capacity is high. Tillage is delayed in spring because of wetness. Runoff is slow.

Most of the acreage is cleared. If it is drained to remove excess surface water, this soil is suited to soybeans, sorghum, cotton, corn, and small grain. It is well suited to rice. Because of the pattern of narrow depressions in which this soil occurs, many areas are planted to the same crops as the adjacent soils. These depressions are good locations for ditches to drain the more productive adjoining Dubbs and Dundee soils. (Capability unit IIIw–4; woodland suitability group 6)

Forestdale silty clay loam, 0 to 3 percent slopes (Fr).—This soil occurs in the western and central parts of the county. It has the profile described as typical of the series. Included in the areas mapped are small areas of Alligator silty clay loam and of Forestdale silt loam.

This soil has medium tilth. At times tillage is delayed in spring because of wetness. The natural fertility is moderate. Permeability is slow. The available water capacity is moderately high. Runoff is slow to medium, and the erosion hazard is slight.

Most of this acreage is open land and is used for crops and pasture. Soybeans, small grain, rice, sorghum, cotton, grasses, and legumes are well suited. Drainage is needed to remove excess surface water. (Capability unit IIIw–4; woodland suitability group 6)

Grenada Series

The Grenada series consists of moderately well drained, acid soils that have a fragipan. These soils formed in silty (loessal) material of the uplands. The native vegetation consists of upland hardwoods.

In a typical profile, the surface layer is brown silt loam about 6 inches thick. The subsoil is yellowish-brown silt loam that extends to a depth of 22 inches and is mottled below a depth of 16 inches. Below this is a 4-inch transitional layer of light brownish-gray silt loam, and below this, a thick, mottled fragipan of silt loam texture.

Profile of Grenada silt loam, 0 to 2 percent slopes. The location is 0.25 mile west of the Yalobusha County

line and 0.25 mile north of Tillatoba Creek, in the NE¼ NE¼ sec. 25, T. 25 N., R. 3 E. Pasture, 1 percent slope.

Ap—0 to 6 inches, brown (10YR 5/3) silt loam; common, medium, distinct mottles of light gray (10YR 6/1); weak, fine, granular structure; friable; many fine roots; worm casts; mildly alkaline (limed); abrupt, smooth boundary.

B21—6 to 16 inches, yellowish-brown (10YR 5/6) heavy silt loam; moderate, medium and fine, subangular blocky structure; friable; few, thin, gray silt coats; many fine roots; worm casts; strongly acid; clear, smooth boundary.

B22—16 to 22 inches, yellowish-brown (10YR 5/4) silt loam; few to common, faint mottles of pale brown and dark yellowish brown; moderate, medium and fine, subangular blocky structure; friable; few fine roots; few patchy clay flows in pores; common, fine, brown and black concretions; gray silt coatings around peds; strongly acid; clear, smooth boundary.

A'2—22 to 26 inches, light brownish-gray (10YR 6/2) silt loam; few, medium, distinct mottles of yellowish brown (10YR 5/6); weak, medium and fine, subangular blocky structure; friable; slightly brittle; common, fine, brown and black concretions; gray silt coats around peds; strongly acid; clear, smooth boundary.

B'x1—26 to 34 inches, mottled light-gray (10YR 7/1), pale-brown (10YR 6/3), and dark-brown (7.5YR 4/4) heavy silt loam; moderate, medium, subangular and angular blocky structure; firm; compact and brittle; polygonal cracks filled with gray silt loam extending down through lower horizons; few patchy clay films; many gray silt coatings; common, medium, brown and black concretions; strongly acid; clear, smooth boundary.

B'x2—34 to 45 inches, mottled dark yellowish-brown (10YR 4/4), pale-brown (10YR 6/3), and light-gray (10YR 7/1) heavy silt loam; moderate, medium, subangular and angular blocky structure; brittle and compact; firm; few patchy clay films; many, fine to medium, brown and black concretions; many voids; strongly acid; clear, smooth boundary.

B'x3—45 to 60 inches, mottled pale-brown (10YR 6/3), light brownish-gray (10YR 6/2), and dark-brown (10YR 4/3) silt loam; weak, medium, subangular blocky structure; friable to firm; slightly brittle and compact; few voids; few, fine, brown and black concretions; strongly acid.

The color of the Ap horizon, and of the A2 horizon where one is present, is grayish brown to light yellowish brown. The color of the B2 horizon is dominantly yellowish brown, mottled with shades of gray and brown in the B22 horizon. The layer immediately above the fragipan has a matrix color of pale brown, light brownish gray, or light gray and distinct mottles of brown. In most places the fragipan is mottled with browns and grays. Some profiles have a Cx horizon, generally below a depth of 60 inches. This horizon has a silt loam texture. The fragipan is moderate to strong. In some places there are concretions throughout the profile.

Grenada soils occur in the eastern part of the county, with Memphis, Loring, Calloway, and Calhoun soils. They are less well drained than Memphis soils, and Memphis soils lack a fragipan. Grenada soils are more poorly drained than Loring soils, and they lack clay films in the B horizon above the fragipan. They have a greater clay content in the lower subsoil than Loring soils. They are better drained than Calloway soils and are free of grayish mottles in the uppermost 10 inches of the subsoil. Grenada soils have a fragipan and are better drained and less gray than Calhoun soils.

Grenada silt loam, 0 to 2 percent slopes (GrA).—This soil occurs mainly near or next to flood plains. It is at a higher elevation in the eastern part of the county than in other parts. It has the profile described as typical of the series. Included in the areas mapped are areas of Loring, Calloway, and Calhoun silt loams. The Loring and Calloway soils occur as narrow bands and make up less than 8 percent of the unit. The poorly drained Calhoun soils are in small shallow depressions. In some places the surface layer is eroded and is now only about 3 inches thick.

This soil has good tilth, and it can be cultivated throughout a moderate range of moisture content without clodding. Runoff is slow, and the erosion hazard is slight. Infiltration of water is slow. Permeability is moderate above the fragipan and slow through the fragipan. The natural fertility and the available water capacity are moderate.

Approximately 90 percent of this soil is cultivated or used for pasture. The rest is woodland. Cotton, corn, soybeans, small grain, pasture plants, and trees are well suited. (Capability unit IIw–1; woodland suitability group 10)

Grenada silt loam, 2 to 5 percent slopes, eroded (GrB2).—This soil occurs as narrow bands and gently sloping ridges near or adjacent to flood plains but at higher elevations, in the eastern part of the county. Included in the areas mapped are small areas of Loring and Calloway silt loams that make up less than 10 percent of this mapping unit. Also included are areas that have original surface layers dominantly 6 inches or more in thickness. Nineteen percent of the area is sloping.

This soil has a surface layer of brown, friable silt loam about 4 inches thick. In places the surface layer and subsoil have been mixed by tillage. Most fields have a few small rills.

The upper 17 inches of the subsoil is friable, yellowish-brown heavy silt loam. At a depth of about 22 inches, there is a layer of pale-brown or gray silt loam. It is underlain by a thick fragipan of gray and brown heavy silt loam.

This soil has good tilth, and it can be cultivated throughout a moderate range of moisture content without clodding. Infiltration of water is slow. Permeability is moderate above the fragipan and slow through the fragipan. The natural fertility and the available water capacity are moderate. Runoff is medium, and the erosion hazard is moderate.

Approximately 75 percent of this soil is cultivated or used for pasture. The rest is woodland. Cotton, corn, soybeans, small grain, pasture plants, and trees are well suited. (Capability unit IIe–3; woodland suitability group 10)

Grenada silt loam, 2 to 8 percent slopes, severely eroded (GrC3).—This soil occurs on gently to moderately sloping ridges and foot slopes adjacent to stream flood plains in the eastern part of the county. Included in the areas mapped are small areas of Loring silt loam, which make up about 10 percent of this mapping unit.

In most places, much of the original surface layer has been removed by erosion and the rest is mixed with the subsoil. Most fields have a few rills and small, shallow gullies. The present surface layer is friable, yellowish-brown heavy silt loam. The upper part of the subsoil, about 11 inches thick, is friable heavy silt loam. At a depth of about 15 inches, there is a layer of pale-brown or gray silt loam. It is underlain by a thick fragipan of gray and brown heavy silt loam.

This soil has fairly good tilth, but crusting is common

following heavy rains. Runoff is medium to rapid, and when the soil is cultivated, the erosion hazard is severe. Infiltration of water is slow. Permeability is moderate above the fragipan and slow through the fragipan. The natural fertility and the available water capacity are moderate.

Approximately 75 percent of this soil is cultivated or used for pasture. The rest is either idle or has scrubby stands of bushes and trees. In cultivated areas, very careful management is needed to control erosion. Cotton, soybeans, small grain, pasture plants, and pine trees are suited. (Capability unit IVe–4; woodland suitability group 10)

Gullied Land

Gullied land is a land type that is so eroded that only narrow isolated areas of the original soils, which were mostly Memphis soils, remain between the gullies. The gullies range from about a quarter of an acre to several acres in size. Most are between 2 and 10 feet in depth, but a few are deeper. Most of the soil material washed from the gullies is silty, but a few of the deeper gullies extend into the underlying sandy material. The silty sediment improves the soils on the adjacent flood plains but is damaging to crops and pasture if deposited during the growing season.

Gullied land-Memphis complex, 8 to 40 percent slopes (GuF).—This complex is on uplands in the eastern part of the county. The slope is dominantly 10 to 25 percent. Each area is about 75 percent Gullied land and about 25 percent Memphis soils, and the pattern is uniform from area to area.

The Gullied land soil material ranges from silt loam to silty clay loam in texture. It is strongly acid. Runoff is rapid, and permeability is moderate. Fertility and the available water capacity vary.

The Memphis soil in this complex has a surface layer of grayish-brown to yellowish-brown, friable silt loam that is about 4 inches thick. The upper part of the subsoil is dark-brown silty clay loam; the lower part is yellowish-brown silt loam. Infiltration is slow, and permeability is moderate. Fertility is moderate. The available water capacity is high. Runoff is medium to rapid.

These areas are suited to pine trees. Reclaiming them so they could be used for pasture would be difficult and so expensive as to be economically impractical. (Capability unit VIIe–3; woodland suitability group 17)

Leverett Series

The Leverett series consists of nearly level to gently sloping, moderately well drained, strongly acid soils that formed in silty sediments on flood plains and low terraces. The native vegetation consists of hardwoods, canes, and vines.

In a typical profile, the surface layer is brown silt loam about 7 inches thick. The upper part of the subsoil is dark-brown silt loam over yellowish-brown silt loam. At a depth of 28 inches is a mottled fragipan about 13 inches thick.

Profile of Leverett silt loam, 0 to 2 percent slopes. The location is 3 miles west of Charleston, Miss., half a mile north of State Highway 32, 300 feet south of Illinois Central Railroad, 70 feet east of bayou, and 200 feet north of turnrow, in the NE¼SW¼ sec. 32, T. 25 N., R. 2 E. Cultivated field, 1 percent slope.

Ap—0 to 7 inches, brown to dark-brown (10YR 4/3) silt loam; weak, medium, platy structure breaking to weak, fine, granular; friable; common fine roots; strongly acid; abrupt, smooth boundary.

B21t—7 to 21 inches, dark-brown (7.5YR 4/4) silt loam; weak to moderate, medium, subangular blocky structure; friable; few, thin, patchy clay films on peds and in pores; few fine roots; few wormholes; strongly acid; clear, smooth boundary.

B22t—21 to 28 inches, yellowish-brown (10YR 5/6) silt loam; weak to moderate, medium, subangular blocky structure; friable; few, thin, patchy clay films on peds and in pores; few fine roots; strongly acid; clear, smooth boundary.

Bx1—28 to 37 inches, mottled pale-brown (10YR 6/3), brown to dark brown (10YR 4/3), yellowish-brown (10YR 5/6), and light brownish-gray (10YR 6/2) silt; weak, medium, subangular blocky structure; friable; slightly compact and slightly brittle; common, medium, black and brown concretions; few clay flows in pores and cracks; few fine voids; strongly acid; clear, smooth boundary.

Bx2—37 to 41 inches, mottled dark yellowish-brown (10YR 4/4) and pale-brown (10YR 6/2) silt; weak, medium, subangular blocky structure; friable; slightly compact and brittle; common, large, black and brown concretions; strongly acid; clear, smooth boundary.

C—41 to 60 inches, light-gray (10YR 7/1) silt; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; structureless; friable; strongly acid.

The color of the Ap horizon is brown to dark brown or pale brown. The texture of the subsoil is silt loam or silt loam high in very fine sand and less than 18 percent clay. The color of the upper part of the subsoil is dark brown, yellowish brown, or brown. The texture of the Bx horizon is silt, silt loam, or very fine sandy loam. Generally this horizon is mottled with shades of brown and gray. The C horizon is silt, silt loam, or very fine sandy loam and either has a matrix color of gray or is mottled. The depth to the fragipan (Bx horizon) ranges from 20 to 36 inches. The reaction throughout the profile is medium acid to very strongly acid. The thickness of the solum ranges from 36 to 60 inches.

Leverett soils occur in the eastern part of the county, with Tippo, Falaya, Cascilla, Calhoun, Bonn, and Loring soils. Leverett soils are better drained than Tippo and Falaya soils, and they have a B horizon, which Falaya soils lack. They have a fragipan and are less well drained than Cascilla soils. Leverett soils are better drained than Calhoun and Bonn soils and lack the sodium horizons that are characteristic of Bonn soils. Leverett soils have a coarser textured subsoil than Loring soils.

Leverett silt loam, 0 to 2 percent slopes (LeA).—This soil occurs on old flood plains in the eastern part of the county. It has the profile described as typical of the series. Included in the areas mapped are small areas of Loring soils and Tippo soils.

The natural fertility is moderate to high. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is high. Runoff is medium, and the erosion hazard is slight.

Most of the acreage is cultivated or used for pasture. Cotton, corn, soybeans, small grain, and pasture plants are suitable crops. (Capability unit I–2; woodland suitability group 12)

Leverett silt loam, 2 to 5 percent slopes (LeB).—This soil occurs in the eastern part of the county. Included in

the areas mapped are small areas that are moderately eroded.

This soil has a surface layer of brown silt loam about 5 inches thick. The upper part of the subsoil, about 15 to 20 inches thick, is yellowish-brown silt loam. It is underlain at a depth of about 26 inches by a mottled brown and gray fragipan.

The natural fertility is moderate to high. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is high. Runoff is medium, and the erosion hazard is slight.

Most of the acreage is cultivated or used for pasture. Cotton, corn, soybeans, small grain, and pasture plants are suitable crops. Rows should be run on the contour to control erosion and conserve moisture. (Capability unit IIe–3; woodland suitability group 12)

Loring Series

The Loring series consists of moderately well drained, acid soils that formed in silty (loessal) material. The native vegetation consists of upland hardwoods and shortleaf pine.

In a typical profile, the surface layer is grayish-brown to dark grayish-brown silt loam about 4 inches thick. Below it is a 3-inch transitional layer of brown to yellowish-brown silt loam. The upper part of the subsoil is dark-brown silty clay loam over heavy silt loam. At a depth of 25 inches is a thick fragipan. The uppermost 3 inches of the pan is yellowish-brown to dark yellowish-brown silt loam mottled with light gray; the next 16 inches is yellowish-brown to dark yellowish-brown silt loam free of mottling; and the bottom 16 inches is mottled dark yellowish-brown, light yellowish-brown, and light-gray silt loam.

Profile of Loring silt loam, 2 to 5 percent slopes, eroded. The location is approximately a quarter of a mile north of Ascalmore Creek and 300 feet south of county road, in the NW¼NE¼ sec. 30, T. 24 N., R. 3 E. Pasture, 4 percent slope.

Ap—0 to 4 inches, grayish-brown (10YR 5/2) to dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; many fine roots and worm casts; slightly acid; abrupt, smooth boundary.

B&A—4 to 7 inches, brown (10YR 5/3) to yellowish-brown (10YR 5/6) silt loam; weak, medium, subangular blocky structure; friable; common fine roots and worm casts; mixing from A horizon in wormholes; medium acid; abrupt, smooth boundary.

B21t—7 to 17 inches, dark-brown (7.5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; friable; patchy clay films on peds; few fine roots; few worm casts; few, large, black concretions or coatings in lower part; medium acid; clear, smooth boundary.

B22t—17 to 25 inches, dark-brown (7.5YR 4/4) heavy silt loam; moderate, medium, subangular blocky structure; friable; few patchy clay films on peds; few light-gray (10YR 7/1) silt coatings on peds; few fine roots; few worm casts; few, large, black concretions or coatings; strongly acid; clear, smooth boundary.

Bx1—25 to 28 inches, yellowish-brown (10YR 5/4) to dark yellowish-brown (10YR 4/4) silt loam; many, medium, distinct, light-gray (10YR 7/1) mottles and coatings; moderate, medium, subangular blocky structure; friable; compact and brittle; few fine voids; patchy clay films; common black concretions; strongly acid; clear, smooth boundary.

Bx2—28 to 44 inches, yellowish-brown (10YR 5/4) to dark yellowish-brown (10YR 4/4) silt loam; weak, coarse, subangular blocky structure; friable; compact and brittle; light-gray (10YR 7/1) silt in polygonal cracks; few roots in cracks; slightly compact patchy clay films in cracks and on peds; few black concretions; strongly acid; clear, smooth boundary.

Bx3—44 to 60 inches, mottled dark yellowish-brown (10YR 4/4), light yellowish-brown (10YR 6/4), and light-gray (10YR 7/1) silt loam; structureless; friable; slightly compact; few black concretions; medium acid.

The color of the Ap horizon, and of the A2 horizon where one is present, is grayish brown, brown, or pale brown. The texture of the B2 horizon ranges from silty clay loam to silt loam. The color of the B2 horizon is dominantly dark brown and strong brown but ranges to yellowish brown and dark yellowish brown. The fragipan, or Bx horizon, is weakly expressed. It is 14 to 36 inches thick. Usually it has a matrix color of yellowish brown and distinct mottles of gray and brown. Some profiles have a C or a Cx horizon of silt loam texture, generally below a depth of 4 feet. A few black and brown concretions are present in the B22t horizon and the Bx horizon.

Loring soils occur throughout the uplands in the eastern part of the county, with Memphis, Grenada, Calloway, and Calhoun soils. Loring and Memphis soils have similar upper subsoils, but Memphis soils do not have a fragipan. Loring soils are better drained than Grenada, Calloway, and Calhoun soils. They have a more weakly expressed fragipan than Grenada and Calloway soils. Calhoun soils are dominantly gray throughout the upper 30 inches of the solum and have tongues of gray silt extending into the B horizon.

Loring silt loam, 0 to 2 percent slopes (LoA).—This is a moderately well drained soil that occurs on broad ridgetops in the eastern part of the county. Included in the areas mapped are areas of Memphis, Grenada, Calloway, and Calhoun silt loams. The Memphis and Grenada soils occur as long narrow bands and make up about 8 percent of the unit. Calloway and Calhoun soils, which are in small, shallow depressions, make up only a small part of the mapping unit. In some places the surface layer is eroded and is now only about 3 inches thick.

This soil has a surface layer of brown, friable silt loam about 6 inches thick. The upper part of the subsoil, about 18 inches thick, is strong-brown silty clay loam grading to yellowish-brown silt loam. It is underlain by a fragipan of mottled yellowish-brown and brownish-gray silt loam that is 14 to 36 inches thick.

The natural fertility is moderate. Infiltration is slow. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is high. Runoff is slow, and the erosion hazard is slight.

Approximately 90 percent of the acreage is cultivated or used for pasture. The rest is woodland. Cotton, corn, soybeans, small grain, pasture plants, and trees are well suited. (Capability unit I–1; woodland suitability group 12)

Loring silt loam, 2 to 5 percent slopes, eroded (LoB2).—This is a moderately well drained soil that occurs on medium to broad ridgetops and side slopes in the eastern part of the county. It has the profile described as typical of the series. The surface layer has been thinned by erosion, and in some fields the present surface layer consists of a mixture of subsoil and what is left of the original surface layer. Most fields have a few small rills. Included in the areas mapped are long, narrow bands of Memphis silt loam and Grenada silt loam, which make up about 10

percent of the mapping unit. About 20 percent of the acreage is only slightly eroded, and about 3 percent is severely eroded.

The natural fertility is moderate. Infiltration is slow. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is high. Runoff is medium, and the erosion hazard is moderate.

Approximately 75 percent of the acreage is cultivated or used for pasture. The rest is woodland. Cotton, corn, soybeans, small grain, pasture plants, and trees are well suited. (Capability unit IIe–1; woodland suitability group 12)

Loring silt loam, 5 to 8 percent slopes, eroded (LoC2).—This is a moderately well drained soil that occurs on long, narrow ridgetops and relatively broad side slopes in the eastern part of the county. Included in the areas mapped are long, narrow bands of Memphis silt loam and Grenada silt loam, which make up about 10 percent of the acreage. Also included are some slightly eroded areas and some severely eroded areas where the surface layer is heavy silt loam.

This soil has a surface layer of pale-brown or grayish-brown, friable silt loam about 5 inches thick. In some fields this layer consists of a mixture of subsoil and what is left of the original surface layer. Most fields have a few small rills. The upper part of the subsoil, about 24 inches thick, is dark-brown silty clay loam grading to silt loam. It is underlain by a fragipan of yellowish-brown silt loam mottled with gray. The fragipan is about 14 to 36 inches thick.

The natural fertility is moderate. Infiltration is slow. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is high. Runoff is medium, and the erosion hazard is severe.

Approximately 60 percent of this soil is cultivated or used for pasture. The rest is woodland. Cotton, corn, pasture plants, and trees are well suited. (Capability unit IIIe–1; woodland suitability group 12)

Loring silt loam, 8 to 12 percent slopes, eroded (LoD2).—This is a moderately well drained soil that occurs on ridges and side slopes in the eastern part of the county. The areas range up to 20 acres in size. Included in the areas mapped are narrow bands of Memphis silt loam, which make up about 12 percent of the acreage. Also included are some severely eroded areas where the texture is heavy silt loam.

The surface layer is dark grayish-brown to brown, friable silt loam about 4 inches thick. In most fields this layer consists of a mixture of the surface layer and the subsoil. Most fields have a few small, shallow gullies and rills. The upper part of the subsoil, about 17 inches thick, is strong-brown silty clay loam grading to dark yellowish-brown silt loam with depth. It is underlain by a mottled yellowish-brown, pale-brown, and light-gray silt loam fragipan that is compact and brittle. The fragipan is about 14 to 36 inches thick.

The natural fertility is moderate. Infiltration is slow. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is high. Runoff is rapid, and the erosion hazard is severe.

Approximately 50 percent of the acreage is cultivated or used for pasture. The rest is woodland. This soil is better suited to pasture and trees than to cultivated crops. (Capability unit IVe–1; woodland suitability group 12)

Memphis Series

The Memphis series consists of deep, well-drained, acid soils that formed in thick beds of silty (loessal) materials. The native vegetation consists of upland hardwoods and shortleaf pines.

In a typical profile, the surface layer is brown silt loam about 8 inches thick. The subsoil is dark-brown silty clay loam to a depth of about 28 inches and is dark-brown to dark yellowish-brown silt loam to a depth of about 60 inches.

Profile of Memphis silt loam, 0 to 2 percent slopes. The location is 7 miles south of Charleston, Miss., at Paynes, 0.1 mile east of State Highway 35 and 130 feet north of a gravel road, in the SE¼SE¼ sec. 22, T. 24 N., R. 2 E.

Ap—0 to 8 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; many fine roots; few worm casts; strongly acid; abrupt, smooth boundary.

B21t—8 to 20 inches, dark-brown (7.5YR 4/4) silty clay loam; strong, fine and medium, subangular blocky structure; friable; many fine roots; few worm casts; clay films continuous on some peds; strongly acid; clear, smooth boundary.

B22t—20 to 28 inches, dark-brown (7.5YR 4/4) light silty clay loam; moderate, medium, subangular blocky structure; friable; few fine roots; clay films continuous on some peds; strongly acid; clear, smooth boundary.

B23t—28 to 45 inches, dark-brown (7.5YR 4/4) silt loam; moderate, medium and fine, subangular blocky structure; friable; few fine roots; few light-gray silt coatings; patchy clay films; strongly acid; gradual, smooth boundary.

B3—45 to 60 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, medium, subangular blocky structure; friable; few fine roots; few pale-brown silt coatings; few black splotches; strongly acid.

The color of the A horizon ranges from yellowish brown to dark grayish brown. The color of the upper part of the B horizon ranges from dark brown to strong brown. The texture ranges from silt loam to silty clay loam. In some profiles there is a B1 horizon of brown to dark-brown heavy silt loam, 4 to 7 inches thick, that has not been incorporated into the plow layer. Pale-brown or light-gray silt coatings and a few brown and black concretions are present in the lower part of the B horizon. In some profiles there is a C horizon of yellowish-brown silt loam at a depth of less than 60 inches.

Memphis soils occur throughout the uplands in the eastern part of the county, with Natchez, Loring, Grenada, Calloway, and Calhoun soils. Memphis soils are finer textured in the subsoil, are more acid throughout the profile, and have stronger profile development than Natchez soils. Memphis soils are better drained and lack the fragipan of Loring, Grenada, and Calloway soils. Calhoun soils are dominantly gray in the upper 30 inches of the solum.

Memphis silt loam, 0 to 2 percent slopes (MeA).—This soil occurs on broad, rather smooth ridgetops. It has the profile described as typical of the series. The slope is most commonly about 1 percent. Included in the areas mapped are areas of Loring, Grenada, Calloway, and Calhoun silt loams. The Loring and Grenada soils occur as narrow bands and make up about 8 percent of the unit. Calhoun and Calloway soils are in small, shallow de-

pressions. In some places the surface layer has eroded and is now only about 3 inches thick.

The natural fertility is moderate. Infiltration is slow, and permeability is moderate. The available water capacity is high. Runoff is slow, and the erosion hazard is slight.

Approximately 90 percent of the acreage is cultivated or used for pasture. The rest is woodland. Cotton, corn, soybeans, small grain, pasture plants, and trees are well suited. (Capability unit I–1; woodland suitability group 13)

Memphis silt loam, 2 to 5 percent slopes, eroded (MeB2).—This soil occurs in the eastern part of the county. Included in the areas mapped are small areas of Loring silt loam and Grenada silt loam.

This soil has a surface layer of brown, friable silt loam about 5 inches thick. The subsoil is dark-brown to strong-brown silty clay loam in the upper part and silt loam in the lower part.

The natural fertility is moderate. Infiltration is slow, and permeability is moderate. The available water capacity is high. Runoff is medium, and the erosion hazard is moderate.

Approximately 75 percent of the acreage is cultivated or used for pasture. The rest is woodland. Cotton, corn, soybeans, small grain, pasture plants, and trees are well suited. (Capability unit IIe–1; woodland suitability group 13)

Memphis silt loam, 5 to 8 percent slopes, eroded (MeC2).—This soil occurs on narrow, elongated ridgetops and relatively broad side slopes in the eastern part of the county. Included in the areas mapped are small areas of Loring silt loam, which make up about 12 percent of the mapping unit.

The surface layer is grayish-brown to brown, friable silt loam about 4 inches thick. In some fields this layer consists of a mixture of subsoil and the remaining part of the original surface layer. Most fields have a few small rills. The subsoil, about 32 inches thick, is dark-brown to strong-brown silty clay loam in the upper part and yellowish-brown silt loam in the lower part.

The natural fertility is moderate. Infiltration is slow, and permeability is moderate. The available water capacity is high. Runoff is medium, and the erosion hazard is severe.

Approximately 50 percent of the acreage is cultivated or used for pasture. The rest is woodland. Cotton, corn, soybeans, small grain, pasture plants, and trees are well suited. (Capability unit IIIe–1; woodland suitability group 13)

Memphis silt loam, 8 to 12 percent slopes, eroded (MeD2).—This soil occurs on ridges and side slopes, in the eastern part of the county. Included in the areas mapped are small areas of Loring silt loam, which make up about 12 percent of the acreage. Some areas are only slightly eroded, and some areas are severely eroded and have a surface layer of heavy silt loam.

The surface layer is brown to yellowish-brown, friable silt loam about 4 inches thick. It has been thinned by erosion. In some fields it consists of a mixture of subsoil and the remaining part of the original surface layer. Most fields have a few small rills. The subsoil is dark-brown silty clay loam in the upper part and dark yellowish-brown silt loam in the lower part.

The natural fertility is moderate. Infiltration is slow, and permeability is moderate. The available water capacity is high. Runoff is rapid, and the erosion hazard is very severe.

Approximately 50 percent of the acreage is cultivated or used for pasture. The rest is woodland. Pasture plants and trees are better suited than cultivated crops. (Capability unit IVe–1; woodland suitability group 13)

Memphis silt loam, 5 to 12 percent slopes, severely eroded (MeD3).—This soil occurs on narrow, elongated ridgetops and relatively broad side slopes in the eastern part of the county. Included in the areas mapped are small areas of Loring and Grenada silt loams, which make up about 12 percent of the acreage. About 10 percent of the unit has a surface layer that is only moderately eroded.

The surface layer is yellowish-brown, friable heavy silt loam. It has been thinned by erosion. In most fields it consists of a mixture of subsoil and the remaining part of the original surface layer. Most fields have a few small shallow gullies and rills. The subsoil is dark-brown silty clay loam in the upper part and dark yellowish-brown silt loam in the lower part.

This soil has good tilth. The natural fertility is moderate. Infiltration is slow, and permeability is moderate. The available water capacity is high. Runoff is medium to rapid, and the erosion hazard is severe.

Approximately 50 percent of the acreage is cultivated or used for pasture. The rest is woodland. Cotton, corn, soybeans, and small grain can be grown, but pasture plants and pine trees are better suited. Careful management for control of erosion is needed if cultivated crops are grown. (Capability unit IVe–1; woodland suitability group 17)

Memphis silt loam, 12 to 17 percent slopes (MeE).—This soil occurs on ridges and side slopes in the eastern part of the county. Included in the areas mapped are small areas of Loring silt loam, which make up about 10 percent of the acreage. Some areas are only slightly eroded, and some are severely eroded and have a surface layer of heavy silt loam.

The surface layer is dark grayish-brown to brown, friable silt loam about 5 inches thick. In some fields this layer consists of a mixture of subsoil and the remaining part of the surface layer. Most fields have a few small, shallow gullies and rills. The subsoil is dark-brown or strong-brown silty clay loam in the upper part and yellowish-brown silt loam in the lower part.

The natural fertility is moderate. Infiltration is slow, and permeability is moderate. The available water capacity is high. Runoff is rapid, and the erosion hazard is very severe.

Approximately 25 percent of the acreage is used for pasture. The rest is woodland. The commonly grown pasture plants and trees are suited. (Capability unit VIe–1; woodland suitability group 13)

Memphis silt loam, 12 to 17 percent slopes, severely eroded (MeE3).—This soil occurs on ridges and side slopes in the eastern part of the county. Included in the areas mapped are small areas of Loring silt loam, which make

up about 10 percent of the acreage. About 5 percent of the unit is only moderately eroded.

The surface layer is dark grayish-brown to yellowish-brown, friable heavy silt loam. In most fields this layer consists of a mixture of subsoil and the remaining part of the surface layer. Most fields have several small, shallow gullies and a few deep gullies. The subsoil is dark-brown silty clay loam in the upper part and yellowish-brown silt loam in the lower part.

The natural fertility is moderate. Infiltration is slow, and permeability is moderate. The available water capacity is high. Runoff is rapid, and the erosion hazard is very severe.

About 50 percent of the acreage is used for pasture or is idle. The rest is planted to pine trees or supports mixed stands of scrubby hardwoods. The commonly grown pasture plants and pine trees are best suited. (Capability unit VIe–1; woodland suitability group 17)

Memphis silt loam, 17 to 40 percent slopes (MeF).—This soil occurs on ridges and side slopes in the eastern part of the county. Included in the areas mapped are small areas of a gravelly, sandy soil that occurs as narrow bands on the lower part of slopes, generally where the gradient is 25 percent or more. These areas make up about 15 percent of the unit. Also included are slightly to severely eroded areas, in which the surface layer is heavy silt loam.

The surface layer is dark grayish-brown to brown, friable silt loam about 6 inches thick. In some places this layer is a mixture of subsoil and the remaining part of the original surface layer. Most fields have a few small gullies and rills. The subsoil is dark-brown or strong-brown silty clay loam in the upper part and yellowish-brown silt loam in the lower part.

The natural fertility is moderate. Infiltration is slow, and permeability is moderate. The available water capacity is high. Runoff is rapid to very rapid, and the erosion hazard is very severe.

Approximately 25 percent of the acreage is used for pasture, and the rest is woodland. The commonly grown pasture plants and trees are suited. (Capability unit VIIe–1; woodland suitability group 13)

Memphis silt loam, 17 to 40 percent slopes, severely eroded (MeF3).—This soil occurs on ridges and side slopes in the eastern part of the county. Included in the areas mapped are small areas of a sandy, gravelly soil that occurs as narrow bands on the lower part of the slopes, generally where the gradient is 25 percent of more. These areas make up about 10 percent of the acreage. About 5 percent of the unit is only moderately eroded.

The surface layer is yellowish-brown, friable heavy silt loam. In most fields this layer is a mixture of subsoil and the remaining part of the original surface layer. Most fields have several small, shallow gullies and a few deep gullies. The subsoil is dark-brown silty clay loam in the upper part and yellowish-brown silt loam in the lower part.

The natural fertility is moderate. Infiltration is slow, and permeability is moderate. The available water capacity is high. Runoff is rapid to very rapid, and the erosion hazard is very severe.

About 50 percent of the acreage is used for pasture or is idle. The rest has been planted to pine trees or supports mixed stands of scrubby hardwoods. Pine trees are well suited. The inclusions of sandy, gravelly soil are sources of gravel. (Capability unit VIIe–1; woodland suitability group 17)

Memphis-Natchez complex, 17 to 40 percent slopes (MnF).—This complex is on the bluff hills adjacent to the Mississippi delta and extends eastward about 3 miles. The landscape is characterized by very narrow, winding ridges and very steep side slopes dissected by numerous short drains. The slope ranges from 17 to 40 percent but most commonly is about 25 percent.

The two dominant soils make up about 70 percent of the acreage; Memphis soils account for about 40 percent, and Natchez soils for about 30 percent. A gravelly loamy sand occurs as narrow bands on lower slopes of more than 25 percent. The pattern and relative extent of Memphis and Natchez soils are fairly uniform. Each delineation contains these two soils, and most of them contain one or more of the minor soils.

The well-drained Memphis soils occur on the middle and upper slopes. The surface layer is dark grayish-brown to brown, friable silt loam about 5 to 8 inches thick. In some areas that have been cleared and cultivated, the surface layer is a mixture of the subsoil and remnants of the surface layer. The subsoil is dark-brown to strong-brown silty clay loam in the upper part and silt loam in the lower part.

Memphis soils are strongly acid, are moderate in natural fertility, and have a high available water capacity. Infiltration is slow, and permeability is moderate.

The well-drained Natchez soils are on the upper side slopes and on very narrow ridgetops. The surface layer is very dark grayish-brown to brown, friable silt loam about 4 to 6 inches thick. The subsoil is yellowish-brown silt loam.

Natchez soils are slightly acid in the uppermost 24 inches and neutral to slightly alkaline below this depth. They are high in natural fertility and have a high available water capacity. Infiltration is slow, and permeability is moderate.

Practically all of the acreage is in hardwood forest. None is suitable for cultivation or pasture. (Capability unit VIIe–1; woodland suitability group 13)

Natchez Series

The Natchez series consists of well-drained soils that formed in silty materials on uplands. The native vegetation consists of upland hardwoods and shortleaf pines. In Tallahatchie County, Natchez soils are mapped only in a complex with Memphis soils.

In a typical profile, the surface layer is very dark grayish-brown to brown silt loam about 4 inches thick. The subsoil is yellowish-brown silt loam that is alkaline in the lower part. Below a depth of about 32 inches is dark yellowish-brown silt loam.

Profile of Natchez silt loam. The location is 2½ miles north of Grenada County line and a fourth of a mile east of State Highway 35, near a gravel pit, in the NE¼SW¼ sec. 24, T. 23 N., R. 2 E.

O1—½ inch to 0, thin covering of partly decayed leaves and twigs.

A1—0 to 4 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, fine and medium, granular structure; friable; common fine and medium roots; medium acid; abrupt, smooth boundary.

B21—4 to 14 inches, yellowish-brown (10YR 5/6) silt loam; weak, fine and medium, subangular blocky structure; friable; many fine and medium roots; common worm casts; medium acid; gradual, smooth boundary.

B22—14 to 22 inches, yellowish-brown (10YR 5/4) silt loam; weak, medium and coarse, subangular blocky structure; friable; many fine and medium roots; many worm casts; slightly acid; gradual, smooth boundary.

B3—22 to 32 inches, yellowish-brown (10YR 5/4) to dark yellowish-brown (10YR 4/4) silt loam; weak, medium and coarse, subangular blocky structure; friable; few fine roots; few worm casts; few fine concretions of calcium carbonate; mildly alkaline; gradual, smooth boundary.

C—32 to 60 inches +, dark yellowish-brown (10YR 4/4) silt loam; weak, coarse, subangular blocky structure; friable; few worm casts in upper 10 inches; common fine concretions of calcium carbonate; size and number of concretions increase with depth; reddish-brown stains around some concretions; few snail shells; mildly alkaline.

The color of the A horizon is very dark grayish brown to brown or grayish brown. The color of the B horizon commonly is yellowish brown but ranges to brown. The color of the C horizon is yellowish brown or dark yellowish brown. The clay content of the B and C horizons is less than 18 percent. In places concretions of calcium carbonate are scattered throughout the profile.

Natchez soils occur with Memphis soils along the bluff hills adjacent to the delta in the eastern part of the county. Natchez soils lack the clay films present in the subsoil of Memphis soils. They are less clayey in the B horizon than Memphis soils.

Rosebloom Series

The Rosebloom series consists of nearly level, poorly drained, acid soils that formed in silty alluvium on flood plains. The native vegetation consists of hardwoods, canes, and vines.

In a typical profile, the surface layer is mottled brown, grayish-brown, and pale-brown silt loam about 8 inches thick. The underlying material is dominantly gray heavy silt loam and silty clay loam.

Profile of Rosebloom silt loam. The location is a fourth of a mile west of Black Bayou and 1,050 feet south of a field road, in the SW¼NE¼ sec. 12, T. 25 N., R. 1 E.

Ap—0 to 8 inches, mottled brown (10YR 4/3), grayish-brown (10YR 5/2), and pale-brown (10YR 6/3) silt loam; massive; friable to firm; slightly plastic; few fine and medium roots; many, coarse, black (10YR 2/1) stains; very strongly acid; abrupt, smooth boundary.

C1g—8 to 24 inches, gray (10YR 6/1) heavy silt loam; few, medium, distinct mottles of dark yellowish brown; massive to weak, medium, subangular blocky structure; friable to firm; plastic; few, fine, black and brown concretions; many, fine to coarse, thin, red (2.5YR 4/6) coatings on peds; few fine roots; very strongly acid; clear, smooth boundary.

C2g—24 to 48 inches, gray (10YR 6/1) silty clay loam; few, fine and medium, distinct mottles of dark brown; massive; firm; plastic; few, fine, brown and black concretions; common, fine and medium, red organic stains; very strongly acid.

The texture of the Ap horizon is silt loam or silty clay loam. The color ranges from grayish brown to gray or mottled gray and shades of brown. The color of the C horizon ranges from gray to light brownish gray. To a depth of 30 inches, this horizon is 80 percent gray. The mottles range from shades of brown to shades of yellow. The texture of the C horizon is heavy silt loam to silty clay loam. The reaction throughout the profile ranges from strongly acid to very strongly acid.

Rosebloom soils occur on the flood plains in the eastern part of the delta, with Collins, Falaya, Tippo, Calhoun, Bonn, and Alligator soils. Rosebloom soils are more poorly drained than Collins, Falaya, and Tippo soils. Calhoun soils are less acid in the lower horizons than Rosebloom soils, and Bonn soils are high in exchangeable sodium. Calhoun, Bonn, and Tippo soils have textural B horizons. Rosebloom soils are less clayey than Alligator soils.

Rosebloom silt loam (0 to 2 percent slopes) (Ro).—This soil occurs on flood plains in the eastern part of the delta. Included in the areas mapped are small areas of Waverly soils. Small areas of a somewhat poorly drained soil are included. Also included are small areas of Calhoun soils.

This soil has moderate tilth. Runoff is slow, and the erosion hazard is slight. The natural fertility is moderate. Permeability is moderately slow. The available water capacity is high.

About 75 percent of this acreage is cultivated or used for pasture. The rest is in hardwoods, among which are oaks, gum, and cottonwood. If drained of excess surface water, this soil is suited to pasture and to some row crops. The major crop grown is soybeans. Cultivation is delayed by a high water table and flooding in spring. (Capability unit IIIw–2; woodland suitability group 15)

Sharkey Series

The Sharkey series consists of nearly level, poorly drained soils that formed in fine-textured sediments deposited by the Mississippi River and its tributaries. The native vegetation consists of hardwoods, canes, and vines.

In a typical profile, the surface layer is very dark grayish-brown clay about 3 inches thick. The underlying material is dark-gray clay to a depth of 50 inches or more. When dry, these soils shrink and form cracks 1 to 3 inches wide and several feet deep. When wet, they expand and seal the cracks.

Profile of Sharkey clay. The location is 3 miles south of Tutwiler, Miss., half a mile east of the Sunflower County line, and 150 feet east of a drainage ditch, in the SW¼SE¼ sec. 6, T. 24 N., R. 2 W.

Ap—0 to 3 inches, very dark grayish-brown (10YR 3/2) clay; weak, fine, subangular blocky structure; firm; plastic and sticky; few fine and medium roots; medium acid; abrupt, smooth boundary.

C1g—3 to 24 inches, dark-gray (10YR 4/1) clay; few, medium, distinct mottles of dark yellowish brown; moderate, fine and medium, subangular blocky structure; firm; very plastic and sticky; few fine roots; some mixing from Ap horizon; slightly acid; clear, smooth boundary.

C2g—24 to 50 inches, dark-gray (10YR 4/1) clay; common, medium, distinct mottles of yellowish brown and dark yellowish brown; weak to moderate, medium, subangular blocky structure; very firm; very plastic and sticky; some mixing from Ap horizon; few, medium, brown concretions; few slickensides; neutral.

The color of the Ap horizon is very dark grayish brown to dark grayish brown. This horizon is 3 to 5 inches thick. The color of the Cg horizon is dominantly dark gray but ranges to gray. The reaction of the Cg horizons ranges from slightly acid to mildly alkaline.

Sharkey soils occur in the western part of the county, with Alligator and Forestdale soils. They are darker colored than Alligator soils and are less acid. Sharkey soils are more clayey than Forestdale soils and are less acid.

Sharkey clay (0 to 2 percent slopes) (Sh).—This soil occurs in the western part of the county. Included in the areas mapped are small areas of Alligator soils.

Because of the clay texture, this soil is difficult to work. It is very plastic and sticky when wet. When dry, it cracks to a depth of 3 to 4 feet. The natural fertility is moderate to high. Permeability is slow. The available water capacity is high. Runoff is slow, and the erosion hazard is slight.

Most of the acreage is cleared and is used for crops or pasture. Soybeans, rice, small grain, cotton, and the commonly grown pasture plants are suitable. Drainage is needed to remove excess surface water. (Capability unit IIIw–6; woodland suitability group 1)

Tensas Series

The Tensas series consists of nearly level, somewhat poorly drained, acid soils that formed in fine textured and moderately fine textured alluvium deposited by the Mississippi River. The native vegetation consists of hardwoods, canes, and vines. In Tallahatchie County, Tensas soils are mapped only in an undifferentiated unit with Dundee soils.

In a typical profile, the surface layer is dark grayish-brown silt loam about 5 inches thick. The subsoil is grayish-brown silty clay loam and silty clay. When dry, these soils shrink and form cracks.

Profile description of Tensas silt loam. The location is 1¼ miles north of Brazil, Miss., and 240 feet east of State Highway 321, in the NW¼NW¼ sec. 14, T. 25 N., R. 1 W. Cultivated field, 1 percent slope.

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; few fine roots; strongly acid; abrupt, smooth boundary.

B21t—5 to 12 inches, grayish-brown (10YR 5/2) silty clay loam; many, medium, distinct mottles of yellowish brown (10YR 5/6); moderate, medium and fine, subangular blocky structure; friable to firm; clay films on peds; few fine roots; strongly acid; clear, smooth boundary.

B22t—12 to 28 inches, grayish-brown (10YR 5/2) silty clay; common, medium, distinct mottles of dark yellowish brown (10YR 4/4); weak, medium, subangular blocky structure; firm; plastic and sticky; clay films on peds; few fine roots; few, fine, black concretions; strongly acid; clear, smooth boundary.

B3t—28 to 46 inches, grayish-brown (10YR 5/2) silty clay loam; common, medium, distinct mottles of yellowish brown (10YR 5/6); weak, medium, subangular blocky structure; friable to firm; slightly plastic and sticky; few, fine, brown and black concretions; medium acid.

The color of the Ap horizon is grayish brown to dark grayish brown. The thickness of the Ap horizon ranges from 4 to 6 inches. The color of the B horizon is dominantly grayish brown but ranges to light brownish gray or gray in the lower part of the horizon. The texture of the B horizon ranges from silty clay to silty clay loam. Distinct mottles of brown and yellowish brown range from few to many throughout the solum. Fine and medium, brown and black concretions range from few to common throughout the solum. The reaction ranges from medium acid to very strongly acid.

Tensas soils occur in the western part of the county, with Alligator, Forestdale, Dundee, and Dubbs soils. Tensas soils are better drained than Alligator soils and are less clayey. They are less gray in the B horizon than Forestdale soils. Tensas soils are similar to Dundee soils in color and internal drainage but are more clayey in the subsoil. They are less well drained than Dubbs soils and are more clayey.

Tippo Series

The Tippo series consists of nearly level, somewhat poorly drained, acid soils that formed in silty sediments on old broad flood plains or low terraces. The native vegetation consists of hardwoods, canes, and vines.

In a typical profile, the surface layer is dark grayish-brown silt loam about 6 inches thick. The upper 9 inches of the subsoil is yellowish brown, mottled silt loam. At a depth of 15 inches is a mottled gray and brown silt loam fragipan about 15 inches thick. The substratum is mottled light-gray, pale-brown, and dark yellowish-brown silt loam.

Profile of Tippo silt loam, 0 to 2 percent slopes. The location is 4 miles west of Charleston, Miss., 1 mile south of State Highway 32, and 30 feet east of a gravel road, in the SW¼SW¼ sec. 6, T. 24 N., R. 2 E.

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; abrupt, smooth boundary.

B2t—6 to 15 inches, yellowish-brown (10YR 5/4) silt loam; common, fine, faint mottles of light brownish gray and pale brown; weak to moderate, medium and fine, subangular blocky structure; friable; many fine roots; few clay films in cracks and pores; few small iron concretions; strongly acid; clear, smooth boundary.

Bx1—15 to 24 inches, mottled gray (10YR 6/1), pale-brown (10YR 6/3), and yellowish-brown (10YR 5/6) silt loam; weak, medium to fine, subangular blocky structure; friable; many small iron concretions and few manganese splotches; vesicular; slightly brittle; very strongly acid; clear, wavy boundary.

Bx2—24 to 30 inches, mottled yellowish-brown (10YR 5/8), light-gray (10YR 7/1), dark yellowish-brown (10YR 4/4), and pale-brown (10YR 6/3) silt loam; weak, fine, subangular blocky structure with tendency toward platy structure; friable; vesicular; few small iron and manganese concretions; very strongly acid.

C1—30 to 50 inches, mottled light-gray (10YR 7/1), pale-brown (10YR 6/3), and dark yellowish-brown (10YR 4/4) silt loam; structureless; friable; few, fine, black and brown concretions; strongly acid; clear, smooth boundary.

C2g—50 to 60 inches, light-gray (10YR 7/1) silt loam; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; structureless; friable; very strongly acid.

The color of the Ap horizon ranges from dark grayish brown to brown. The color of the B2t horizon is dominantly yellowish brown mottled with shades of brown and gray. The texture of the B2t horizon ranges from silt to silt loam. The texture of the Bx horizon, or fragipan, ranges from silt to silt loam; the content of very fine sand is high. Generally the Bx horizon is mottled gray and yellowish brown, but in places it has a matrix color of gray and mottles of yellowish brown. The C horizon is similar to the Bx horizon in texture and color. The reaction throughout the profile is medium acid to very strongly acid.

Tippo soils occur in the eastern part of the county, in association with Bonn, Calhoun, Waverly, Falaya, Collins, and Leverett soils. They have a fragipan and are better drained than Bonn, Calhoun, and Waverly soils, and they lack the sodium content that is characteristic of Bonn soils.

Tippo soils are similar to Falaya soils in internal drainage, but Falaya soils lack the fragipan and the B horizon that are characteristic of Tippo soils. Tippo soils are less well drained than Collins and Leverett soils.

Tippo silt loam, 0 to 2 percent slopes (TpA).—This soil is in the eastern part of the county. Included in the areas mapped are small eroded areas.

This soil can be cultivated within only a narrow to moderate range of moisture content without clodding, and it tends to form a plowsole. The natural fertility is moderate, and the available water capacity is moderate. Permeability is moderate above the fragipan and slow in the fragipan. Runoff is medium to slow, and the erosion hazard is slight.

Most of the acreage is cultivated or used for pasture. Cotton, corn, soybeans, small grain, and pasture plants are suitable. The plowsole ought to be broken up by deep tillage when the soil is dry. (Capability unit IIw–4; woodland suitability group 7)

Tutwiler Series

The Tutwiler series consists of nearly level, well-drained, acid soils that formed in loamy alluvium. The native vegetation consists of hardwoods, canes, and vines.

In a typical profile, the surface layer is dark grayish-brown very fine sandy loam about 6 inches thick. The subsoil is brown very fine sandy loam over dark yellowish-brown loam. The substratum is dark yellowish-brown loamy very fine sand.

Profile of Tutwiler very fine sandy loam, 0 to 3 percent slopes. The location is 1 mile north of Sumner, Miss., one-fourth of a mile east of Illinois Central Railroad, and 450 feet east of turnrow, in the SW¼SW¼ sec. 35, T. 25 N., R. 2 W.

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) very fine sandy loam; weak, fine, granular structure; very friable; many fine roots; medium acid; abrupt, smooth boundary.

B1—6 to 10 inches, brown (10YR 4/3) very fine sandy loam; weak, fine to medium, subangular blocky structure; very friable; many fine roots; medium acid; clear, smooth boundary.

B2t—10 to 24 inches, dark yellowish-brown (10YR 4/4) light loam; weak to moderate, fine to medium, subangular blocky structure; friable; many fine roots; some peds coated with dark-brown clay films; very strongly acid; clear, smooth boundary.

IIC—24 to 48 inches, dark yellowish-brown (10YR 4/4) loamy very fine sand; single grain; loose; very strongly acid.

The color of the Ap horizon is dark grayish brown, brown, or dark brown, and the texture is fine sandy loam to loam. The texture of the B1 horizon is very fine sandy loam to loam, and the color is brown to yellowish brown. The color of the B2t horizon is dark yellowish brown to dark brown, and the texture is commonly loam or heavy fine sandy loam but ranges to silt loam. The thickness of the B2t horizon ranges from 10 to 24 inches. An 8- to 16-inch B horizon of yellowish-brown very fine sandy loam is present in some places. The IIC horizon has the same color range as the B horizon, but the texture ranges from loamy very fine sand to sandy loam. The reaction throughout the profile ranges from medium acid to very strongly acid.

Tutwiler soils occur throughout the delta, with Dubbs, Dundee, Forestdale, and Bruno soils. They are better drained and less clayey in the B horizon than Dubbs, Dundee, and Forestdale soils, and they occur at slightly higher elevations. Tutwiler soils are finer textured than Bruno soils and are not excessively drained.

Tutwiler very fine sandy loam, 0 to 3 percent slopes (TuA).—This soil occurs in the western part of the county, on gently sloping natural levees bordering former channels of the Mississippi River and its tributaries. It has the profile described as typical of the series. Included in the areas mapped are small areas of Forestdale silt loam, depressional, which is poorly drained, and spots of an excessively drained very fine sandy loam.

The natural fertility is moderate. Permeability is moderate in the uppermost two feet and moderately rapid below that depth. The available water capacity is moderate. Runoff is slow. Tilth is good.

Most of this soil is cultivated or used for pasture. Cotton, corn, soybeans, and pasture plants are suitable. Crop rows should be on the contour. (Capability unit I–1; woodland suitability group 2)

Tutwiler-Bruno complex, 0 to 5 percent slopes (TwB).—This complex occurs in the eastern part of the county, on colluvial fans adjacent to the bluff hills and along streams entering the edge of the delta. It is flooded occasionally but usually not during the growing season. Each of the areas mapped is about 60 percent Tutwiler soil and about 25 percent Bruno soil. Also included are small areas of Cascilla soils.

The Tutwiler soil in this complex has a surface layer of dark-brown fine sandy loam about 7 inches thick. The subsoil is dark-brown silt loam about 37 inches thick.

The Bruno soil has a surface layer of dark grayish-brown sandy loam about 6 inches thick. The underlying material, about 34 inches thick, is yellowish-brown gravelly loamy sand.

The natural fertility is moderate to moderately low. Permeability is moderately rapid to rapid. The available water capacity is moderate to low. Runoff is slow to medium, and the erosion hazard is slight.

Most of the acreage is cultivated or is used for pasture. Cotton, corn, soybeans, and small grain are suitable crops. (Capability unit IIIw–5; woodland suitability group 2)

Vicksburg Series

The Vicksburg series consists of nearly level, deep, well-drained, acid soils that formed in thick silty alluvium on flood plains. The native vegetation consists of hardwoods, canes, and vines.

In a typical profile, the surface layer is dark grayish-brown silt loam about 7 inches thick. The underlying material is brown, dark-brown, and dark yellowish-brown silt loam.

Profile of Vicksburg silt loam. The location is 1.25 miles south of Cascilla, Miss., 0.25 mile west of the intersection of gravel roads, 360 feet east of Rattlesnake Creek bridge, and 80 feet south of a gravel road, in the NW¼NW¼ sec. 29, T. 23 N., R. 3 E. Cultivated field.

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; few roots; lowermost 2 inches is slightly compact and platy; strongly acid; abrupt, smooth boundary.

C1—7 to 21 inches, brown (10YR 4/3) silt loam; structureless, but has thin bedding planes; friable; few fine roots; few worm casts; strongly acid; clear, smooth boundary.

C2—21 to 28 inches, dark-brown (10YR 4/3) silt loam; structureless, but has thin bedding planes; friable;

many worm casts; few fine roots; strongly acid; clear, smooth boundary.

C3—28 to 36 inches, dark yellowish-brown (10YR 4/4) silt loam; structureless, but has bedding planes; friable; few pale-brown silt coatings on peds; strongly acid; clear, smooth boundary.

C4—36 to 44 inches, dark yellowish-brown (10YR 4/4) silt loam; common, medium, distinct mottles of gray and pale brown; structureless, but has bedding planes; friable; strongly acid; clear, smooth boundary.

C5—44 to 55 inches, mottled dark yellowish-brown (10YR 4/4), gray (10YR 6/1), and light-gray (10YR 7/2) silt loam; structureless; friable; few, fine, black concretions; strongly acid.

The texture of the Ap horizon is silt loam or silt. Small areas have an overwash of fine sandy loam. The color is dark grayish brown, brown, or yellowish brown. The texture of the upper part of the C horizon is silt loam or silt. The color ranges from dark brown to dark yellowish brown. The lower part of the C horizon has a similar texture and color range but contains few to many mottles below a depth of 20 inches. The fine concretions in the lower part of the C horizon are brown or black and range from few to common. The reaction throughout the profile ranges from medium acid to strongly acid.

Vicksburg soils occur in the eastern part of the county, with Collins, Falaya, Waverly, and Bruno soils. Vicksburg soils are better drained than Collins, Falaya, and Waverly soils. They lack grayish mottles within 20 inches of the surface. Vicksburg soils are siltier than Bruno soils.

Vicksburg silt loam (0 to 2 percent slopes) (Vc).—This soil occurs on alluvial surfaces in the eastern part of the county. It is flooded occasionally but usually not during the growing season. It has the profile described as typical of the series. Included in the areas mapped are small areas of moderately well drained Collins soils.

This soil has good tilth and can be cultivated throughout a moderate range of moisture content without clodding. The natural fertility is moderate. Permeability is moderate. The available water capacity is high. Runoff is slow, and there is little or no risk of erosion.

Most of the acreage is cultivated or is used for pasture. Cotton, corn, soybeans, and small grain are well suited. (Capability unit I–2; woodland suitability group 14)

Vicksburg and Bruno soils (0 to 2 percent slopes) (Vk).—These soils occur on flood plains and in upland drainageways, in the eastern part of the county. They are flooded occasionally during prolonged heavy rainfall, mostly in winter. Many of the areas are partly Vicksburg soil and partly Bruno soil, but some areas are entirely one or the other.

The Vicksburg soil occupies about 50 to 65 percent of the total acreage. It has a surface layer of yellowish-brown fine sandy loam, about 11 inches thick. The upper part of the underlying material, about 23 inches thick, is yellowish-brown to dark-brown silt loam mottled with light brownish gray below a depth of 24 inches. Bedding planes are evident. The lower part of the subsoil is mottled gray and brown silt loam.

The Bruno soil occupies about 20 to 30 percent of the total acreage. It has a surface layer of brown fine sandy loam about 11 inches thick. The rest of the profile, to a depth of 43 inches, is predominantly loamy sand.

Included in the areas mapped are small areas of Collins soils, Falaya soils, and Cascilla soils.

The natural fertility is moderate to low. Permeability is moderate to rapid. Runoff is slow, and there is little or no erosion hazard. The Bruno soil is somewhat droughty.

Most of the acreage is used for row crops and pasture. Cotton, soybeans, small grain, and corn are suitable crops. (Capability unit: Bruno IIIw–5, Vicksburg I–2. Woodland suitability group: Bruno 16, Vicksburg 14)

Waverly Series

The Waverly series consists of nearly level, poorly drained, acid soils that formed in silty alluvium. The native vegetation consists of hardwoods, canes, and vines.

In a typical profile, the surface layer is grayish-brown silt loam, about 5 inches thick, and the substratum is light-gray silt loam to a depth of 45 inches or more.

Profile of Waverly silt loam. The location is 3 miles west of Charleston, Miss., and one-fourth of a mile south of State Highway 32, in the NE¼SW¼ sec. 5, T. 24 N., R. 2 E.

Ap—0 to 5 inches, grayish-brown (10YR 5/2) silt loam; weak, fine granular structure; friable; common fine roots; strongly acid; abrupt, smooth boundary.

C1g—5 to 16 inches, light-gray (10YR 6/1) silt loam; few, fine, distinct mottles of pale brown (10YR 6/3); common reddish-brown stains; weak, coarse, angular and subangular blocky structure; friable; few fine roots; strongly acid; clear, smooth boundary.

C2g—16 to 22 inches, light-gray (10YR 6/1) silt loam; common, medium, distinct mottles of yellowish brown (10YR 5/6); weak, coarse, subangular blocky structure; friable; few, fine to medium, brown and black concretions; strongly acid; clear, smooth boundary.

C3g—22 to 45 inches, light-gray (10YR 6/1) silt loam; common, medium, distinct mottles of dark yellowish brown (10YR 4/4) and grayish brown (10YR 5/2); structureless; friable; common, medium, brown and black concretions; strongly acid.

The color of the Ap horizon is grayish brown or gray. The thickness of the Ap horizon ranges from 3 to 6 inches, and the texture ranges from silt loam to silty clay loam. The color of the Cg horizon is dominantly light gray but ranges to light brownish gray. This horizon has few to common distinct mottles of yellowish brown and pale brown. Fine to medium brown and black concretions range from few to many throughout the profile. The reaction ranges from medium acid to strongly acid.

Waverly soils occur in the eastern part of the county, with Falaya, Collins, Bonn, Calhoun, and Tippo soils. They are more poorly drained and grayer than Falaya and Collins soils. Waverly soils lack the sodium content that is characteristic of Bonn soils. They lack the textural B horizon that is characteristic of Bonn and Calhoun soils. Waverly soils are more poorly drained than Tippo soils and lack a fragipan.

Waverly silt loam (0 to 2 percent slopes) (Wv).—This soil occurs in the eastern part of the county. It is subject to flooding of short duration in winter and early in spring. Included in the areas mapped are small areas of silty clay loam.

This soil tends to pack and crust. The natural fertility is moderate to low. Permeability is moderate, and the available water capacity is moderate. Runoff is very slow, and the water table is high.

About 75 percent of the acreage is cultivated or used for pasture. The rest is in hardwoods. Cotton, corn, soybeans, and small grain are suitable crops. Tillage is delayed in spring by wetness. Drainage is needed to remove excess surface water. Flood damage to crops is moderate

to severe. (Capability unit IIIw–2; woodland suitability group 15)

Use and Management of the Soils [1]

This section discusses the use and management of the soils for crops and pasture, woodland, wildlife, engineering work, and recreation.

Capability Groups of Soils

Capability classification is the grouping of soils to show, in a general way, their suitability for most kinds of farming. It is a practical classification based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment. The classification does not apply to most horticultural crops or to rice and other crops that have special requirements. The soils are classified according to degree and kind of permanent limitation, without considering major and generally expensive alterations in slope, depth, or other characteristics of the soils, and without considering possible but unlikely major reclamation projects.

In the capability system, all kinds of soils are grouped at three levels: the capability class, the subclass, and the unit. The eight capability classes in the broadest grouping are designated by Roman numerals I through VIII. In class I are soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products.

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* means 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 country, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c*, because the soils in it have little or no erosion hazard but have other limitations that limit their use largely to pasture, range, woodland, or wildlife.

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. The capability unit is generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe–1 or IIIe–1. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation, and the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraphs. The Arabic numeral specifically identifies the capability unit within each subclass.

The capability units in Tallahatchie County are described in the following pages. The numbers are not consecutive, because not all of the capability units used in Mississippi occur in this county. The names of the series represented are listed in the description of each unit, but this does not necessarily mean that all the mapping units of those series are included in the particular unit. To find the capability unit designation of a given soil, refer to the "Guide to Mapping Units."

CAPABILITY UNIT I–1

This unit consists of nearly level, moderately well drained to well drained, acid soils of the Loring, Memphis, and Tutwiler series. These soils are on uplands and old natural levees. Loring and Memphis soils have a surface layer of silt loam and a subsoil of silty clay loam. Loring soils have a weak fragipan at a depth of about 25 inches. A fragipan at this depth restricts root growth very little. The Tutwiler soils have a surface layer of very fine sandy loam and a subsoil of loamy fine sand.

Permeability is generally moderate, but it is slow within the fragipan layer of Loring soils. The available water capacity is high in Loring and Memphis soils and moderate in Tutwiler soils. The natural fertility is moderate. Tilth is good.

If good conservation practices are used, row crops can be grown continuously. Cotton, corn, soybeans, small grain, grasses, and legumes are well suited. Crops respond well to fertilizer and lime.

CAPABILITY UNIT I–2

This unit consists of nearly level, well drained to moderately well drained, acid soils of the Cascilla, Collins, Leverett, and Vicksburg series. The surface layer and subsoil of these soils are silt loam. Leverett soils have a fragipan at a depth of about 28 inches.

These soils are fairly easy to till. To prevent clodding and crusting, they should not be cultivated when wet. In some places drainage is needed for removal of excess surface water. Permeability is generally moderate, but it is moderately slow in the fragipan of Leverett soils. The available water capacity is high, and the natural fertility is moderate.

Row crops can be grown continuously. They can also be grown in a rotation with close-growing or sod crops, such as grasses and legumes. Cotton, corn, soybeans, small grain, grasses, and legumes are well suited.

CAPABILITY UNIT I–3

This unit consists of nearly level, well-drained to somewhat poorly drained, acid soils of the Dubbs and Dundee series. These soils are on old natural levees. They have a surface layer of very fine sandy loam and a subsoil of silty clay loam to silt loam.

These soils are easy to keep in good tilth. Permeability is generally moderate to moderately slow. The available water capacity and the natural fertility are moderate.

[1] T. R. TAYLOR, management agronomist, SCS, assisted in writing this section.

If good conservation practices are used, row crops can be grown continuously. They can also be grown in a rotation with close-growing crops. Cotton, soybeans, small grain, corn, grasses, and legumes are well suited.

CAPABILITY UNIT IIe–1

This unit consists of gently sloping, somewhat poorly drained to well-drained, acid soils of the Dundee, Dubbs, Loring, and Memphis series. These soils are on uplands and old natural levees. Dundee and Dubbs soils have a surface layer of very fine sandy loam and silt loam. The subsoil is silty clay loam and loam underlain by silt loam. Loring and Memphis soils have a surface layer of silt loam and a subsoil of silty clay loam or silt loam. Loring soils have a fragipan at a depth of about 25 inches.

These soils are easy to work, but they crust and pack when bare. Permeability is generally moderate to moderately slow. The available water capacity is high in Loring and Memphis soils and moderate in Dubbs and Dundee soils. The natural fertility is moderate. Crop rows should be designed to conserve moisture and to control erosion.

If good conservation practices are used, row crops can be grown continuously. A suitable cropping system is 3 years of row crops and 3 years of close-growing crops. Cotton, soybeans, small grain, corn, grasses, and legumes are well suited.

CAPABILITY UNIT IIe–3

This unit consists of gently sloping, moderately well drained, acid soils of the Leverett and Grenada series. These soils are on uplands and older flood plains. They have a surface layer of silt loam, a subsoil of silt loam and silty clay loam, and a fragipan at a depth of 22 to 28 inches.

These soils have fairly good tilth, but they crust and pack when bare. The available water capacity is high in Leverett soils and moderate in Grenada soils. Permeability is generally moderate, but it is slow to moderately slow within the fragipan layers. The natural fertility is moderate to high.

A suitable cropping system is 2 years of row crops and 2 years of small grain and lespedeza. Cotton, annual lespedeza, sericea lespedeza, small grain, grasses, and legumes are well suited. Sorghum, corn, and soybeans are fairly well suited. Crop rows should be so arranged as to conserve moisture and to control erosion.

CAPABILITY UNIT IIe–4

This unit consists of Dundee silty clay loam, 2 to 5 percent slopes, a somewhat poorly drained, acid soil on old natural levees or low terraces. The surface layer and subsoil are silty clay loam.

Most of this soil is used for row crops and pasture. Crop rows should be so arranged as to remove surface water and to control erosion. Permeability is generally moderately slow. The available water capacity and the natural fertility are moderate.

If good conservation practices are used, row crops can be grown continuously. A suitable cropping system is 2 years of oats and lespedeza followed by 2 years of row crops. Commonly grown row crops and pasture plants are well suited.

CAPABILITY UNIT IIw–1

This unit consists of nearly level, somewhat poorly drained and moderately well drained, acid soils of the Dundee, Tensas, and Grenada series. These soils have a surface layer of silt loam or silty clay loam. The subsoil of Dundee and Tensas soils is silty clay loam or silty clay over silt loam or silty clay loam. The subsoil of Grenada soils is heavy silt loam underlain by a thick fragipan.

Permeability is generally moderately slow to slow. The available water capacity and the natural fertility are moderate. Excess water can be disposed of rapidly through V- and W-ditches and field laterals.

Most of the acreage is used for crops and pasture. If good conservation practices are used, row crops can be grown continuously on these soils. A suitable cropping system is 2 years of small grain and lespedeza followed by 2 years of row crops. The principal crops grown are cotton, soybeans, small grain, and corn. Commonly grown grasses and legumes are fairly well suited.

CAPABILITY UNIT IIw–3

This unit consists of nearly level, moderately well drained and somewhat poorly drained, acid soils of the Collins and Falaya series. These soils have a surface layer of silt loam. The subsoil of the Falaya soils is silt loam, and that of the Collins soils is silt loam underlain by clayey material at a depth of about 29 inches.

These soils are fairly easy to till, but they clod and crust if cultivated when wet. Permeability is generally moderate, but it is slow through the underlying clayey material of Collins soils. The available water capacity is moderate to high, and the natural fertility is moderate.

If good conservation practices are used, row crops can be grown continuously. A suitable cropping system is 2 years of small grain and lespedeza followed by 2 years of row crops. The principal crops grown are cotton, soybeans, small grain, and corn. Commonly grown grasses and legumes are fairly well suited (fig. 2). Excess surface water has to be removed. It can be disposed of rapidly through V- and W-ditches and field laterals.

CAPABILITY UNIT IIw–4

This unit consists of nearly level, somewhat poorly drained, acid soils of the Calloway and Tippo series. These soils have a surface layer of silt loam. The subsoil is silt loam underlain by a fragipan at a depth of about 15 to 24 inches.

Permeability is generally moderate above the fragipan and slow to moderately slow within it. The available water capacity is moderate to low, and the natural fertility is low to moderate. These soils are subject to floods that damage crops slightly. They are often too wet or too dry for preparation of seedbeds. Because the fragipan is near the surface, the root zone is restricted. Excess surface water, which is a problem in some cultivated areas, can be disposed of through graded rows, V- and W-ditches, and field laterals. In some areas, diversions are needed for control of water that runs off adjacent hillsides.

Most of the acreage is used for crops and pasture. A small amount is woodland. A suitable cropping system is 2 years of lespedeza followed by 1 year of corn or cotton. Suitable crops are cotton, soybeans, small grain,

Figure 2.—Fescue pasture on Falaya silt loam, which is in capability unit IIw–3.

sorghum, and corn. Bermudagrass, bahiagrass, dallisgrass, sudangrass, and millet are suitable grasses. Wild winter peas, annual and sericea lespedeza, and white clover are suitable legumes. Pines and a few kinds of hardwoods are suitable.

CAPABILITY UNIT IIIe–1

This unit consists of moderately sloping, well-drained, acid soils of the Loring and Memphis series. These soils have a surface layer of silt loam and a subsoil of silty clay loam to silt loam. The Loring soils have a weak fragipan at a depth of about 25 inches. A fragipan at this depth restricts root growth very little.

These soils have moderate natural fertility and high available water capacity. They are easily cultivated. Because of a moderate to severe erosion hazard, they should not be used for row crops every year. Cotton, corn, soybeans, small grain, grasses, and legumes are suitable crops (fig. 3).

CAPABILITY UNIT IIIe–3

This unit consists of Dundee soils, 5 to 8 percent slopes. These soils are somewhat poorly drained and acid. They have a surface layer of silt loam, very fine sandy loam, or silty clay loam. The subsoil is heavy silt loam. It is underlain with very fine sandy loam at a depth of about 30 inches.

Permeability is generally moderately slow. The natural fertility and the available water capacity are moderate.

Most of the acreage is used for pasture, small grain, or row crops. If row crops are grown, they should be rotated with small grain, pasture, or hay. A suitable cropping system is 4 years of a close-growing crop or pasture and 2 years of row crops. Crop rows should be on the contour so as to conserve moisture and to help control erosion.

CAPABILITY UNIT IIIw–2

This unit consists mostly of poorly drained, level and nearly level, acid soils of the Rosebloom and Waverly series. These soils are on flood plains.

The surface layer and subsoil of Rosebloom and Waverly soils are silt loam or silty clay loam. These soils are somewhat difficult to manage because the water table is high after heavy rains in winter and early in spring. During the crop-growing season, they tend to crust and pack. Permeability is generally moderate to moderately slow. The natural fertility is moderate to low. The available water capacity is moderate to high. Waverly silt loam

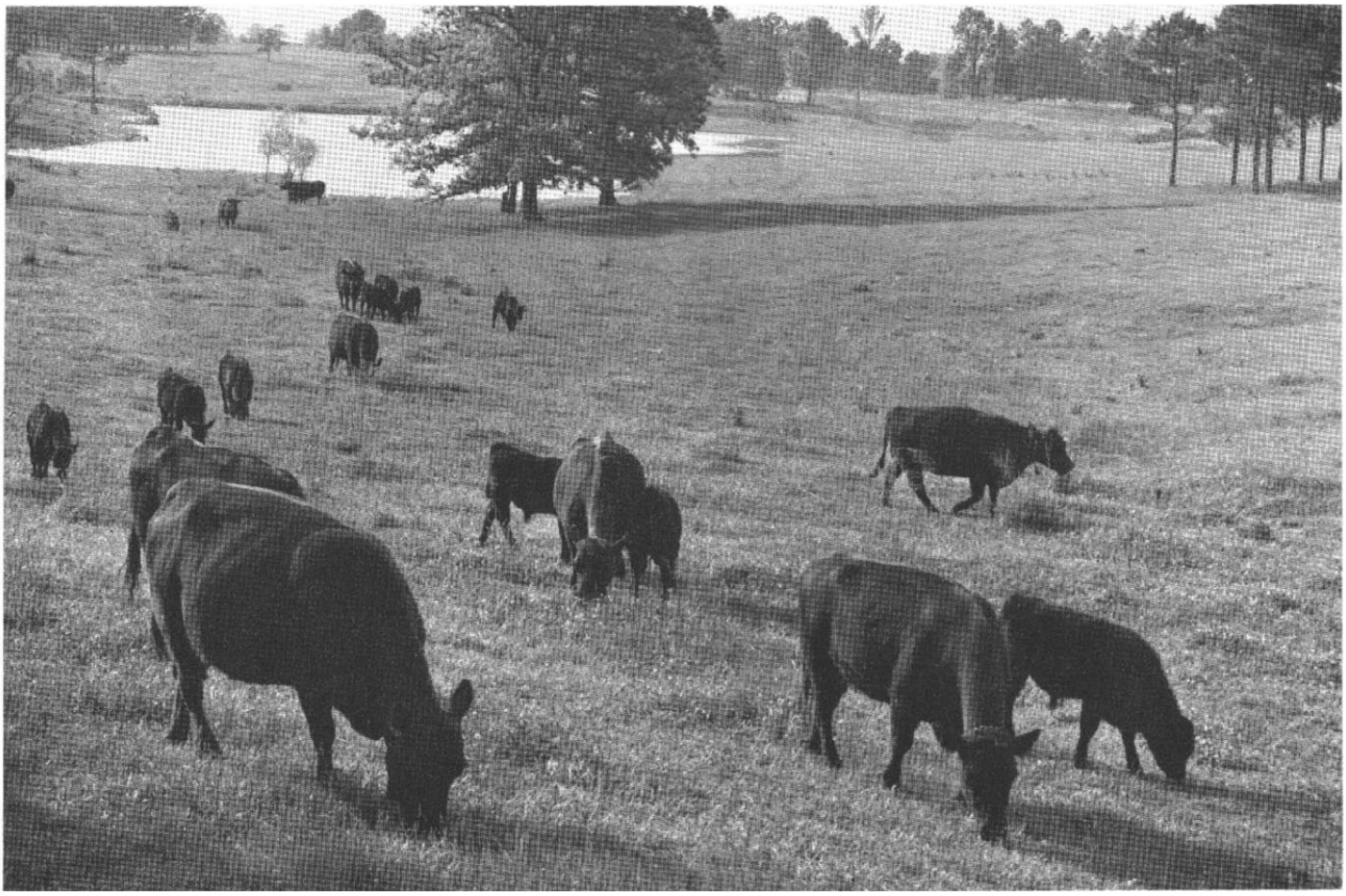

Figure 3.—**Pasture of common bermudagrass and white clover on Memphis silt loam, 5 to 8 percent slopes, eroded, which is in capability unit IIIe–1. Pond in background furnishes water for livestock, fishing, and recreation.**

needs drainage ditches (fig. 4) to remove excess surface water before row crops can be grown.

About 75 percent of the acreage is used for crops and pasture, and the rest is woodland. If good conservation practices are used, row crops can be grown continuously. Soybeans, sorghum, small grain, and cotton are suitable crops. Annual lespedeza, white clover, dallisgrass, bermudagrass, and vetch are suitable pasture plants.

CAPABILITY UNIT IIIw–3

This unit consists of nearly level, poorly drained, acid and alkaline soils of the Calhoun and Bonn series. These soils are on uplands and older flood plains. They have a surface layer of silt loam and a subsoil of heavy silt loam. The Bonn soils are high in sodium content.

These soils are somewhat difficult to work because they get dry and hard during the crop-growing season and have a high water table in winter and early in spring. Excess surface water can be disposed of rapidly through V- and W-ditches and field laterals. Bedding improves drainage and aeration. Permeability is generally moderate to slow. The natural fertility and the available water capacity are moderate.

Most of the acreage is used for crops and pasture. A small part is woodland. A suitable cropping system is 4 years of a close-growing crop followed by 2 years of row crops. Cotton, soybeans, small grain, rice, and pasture are well suited. Bermudagrass, annual lespedeza, dallisgrass, Coastal bermudagrass, white clover, and sericea lespedeza are suitable grasses and legumes.

CAPABILITY UNIT IIIw–4

This unit consists of poorly drained, nearly level and depressional, acid soils of the Alligator and Forestdale series. These soils are on the Mississippi River flood plain. They have a surface layer of silty clay loam and silt loam. Alligator soils have a clay subsoil. Forestdale soils have a silty clay loam to silty clay subsoil underlain by silty clay loam to heavy silt loam.

The natural fertility and the available water capacity are moderate to high. Permeability is generally moderately slow to slow.

Most of the acreage is used for crops and pasture. A small part is woodland. Soybeans, small grain, rice, sorghum, cotton, common grasses, and legumes are suitable crops. Clean-tilled crops can be grown continuously if the residue is managed properly and enough fertilizer is used. Small grain planted on the depressional Forestdale

Figure 4.—Drainage ditch on Waverly silt loam, which is in capability unit IIIw–2.

soils is sometimes drowned out. A drainage system is needed to remove excess surface water.

CAPABILITY UNIT IIIw–5

This unit consists of the Tutwiler-Bruno complex, 0 to 5 percent slopes, and the Bruno part of Crevasse and Bruno soils, an undifferentiated group. These soils are well drained and excessively drained, nearly level to gently sloping, and acid. They have a surface layer of fine sandy loam or sandy loam and a subsoil of silt loam to gravelly sandy loam or loamy sand.

Permeability is generally moderately rapid to rapid. The available water capacity and the natural fertility are moderate to low. The Bruno soils are somewhat droughty.

Most of the acreage is used for crops and pasture. Suitable crops are cotton, small grain, soybeans, and early corn. Suitable pasture plants are annual lespedeza, bermudagrass, and white clover. Drought damage can be minimized by planting crops that mature early.

CAPABILITY UNIT IIIw–6

This unit consists of poorly drained, level to nearly level, acid and nonacid clay soils of the Alligator and Sharkey series. These soils are on the Mississippi River flood plains. They have a surface layer and subsoil of clay.

When these soils are dry, water intake is rapid because of the large cracks, but when they are saturated, intake is very slow. The natural fertility is moderate to high, and the available water capacity is high. Because of the clay texture, these soils are difficult to work. Drainage of excess surface water can be hastened by using surface field drains and drainage mains and laterals.

About 85 percent of the acreage is used for crops and pasture. The rest is in mixed hardwoods. Suitable crops are soybeans, rice, small grain, sorghum, cotton, vetch, and wild winter peas. Suitable for pasture are bermudagrass, dallisgrass, tall fescue, white clover, and sundangrass. A suitable cropping system is 2 years of soybeans, 1 year of cotton, 1 year of small grain, and 1 year of fallow.

CAPABILITY UNIT IVe–1

This unit consists of acid, well-drained, mostly strongly sloping, eroded soils of the Loring and Memphis series. These soils have a surface layer of silt loam and heavy silt loam. Memphis soils have a subsoil of silty clay loam that grades to silt loam with depth. Loring soils have a subsoil of silty clay loam underlain with a fragipan.

Permeability is generally moderate, but it is moderately slow within the fragipan of the Loring soils. The natural fertility is moderate, and the available water capacity is

high. Runoff is rapid. If the soils are cultivated, the erosion hazard is severe.

About half the acreage is used for crops or pasture. The rest is woodland. Pastures should not be overgrazed. Woodlands need protection from overgrazing and from fire. The commonly grown crops, pasture plants, and trees are well suited.

CAPABILITY UNIT IVe-4

This unit consists of Grenada silt loam, 2 to 8 percent slopes, severely eroded, a moderately well drained, gently and moderately sloping, acid soil that has a fragipan and is on uplands. The surface layer and subsoil are heavy silt loam.

Permeability is generally moderate above the fragipan and slow within the fragipan. The natural fertility and the available water capacity are moderate. Tilth is fair, but crusting following heavy rains is common. Runoff is medium to rapid, and when the soil is cultivated, the erosion hazard is severe.

About 75 percent of the acreage is used for crops or pasture. The rest is either idle or in scrubby stands of bushes and trees. The commonly grown row crops and pasture plants and pine trees are suited. Pastures should not be overgrazed.

CAPABILITY UNIT IVw-2

This unit consists of poorly drained, nearly level and depressional, acid soils of the Alligator and Waverly series. These soils are on flood plains.

The Alligator soil is in depressions. It has a surface layer and subsoil of clay. The Waverly soil has a surface layer and subsoil of silt loam.

Permeability is generally moderately slow to very slow. The available water capacity and the natural fertility are moderate to high. The clay texture and depressed position of the Alligator soil cause it to stay wet in spring and thus delay tillage.

The Waverly soil is flooded for long periods each year. It is suited to mixed hardwoods and pasture. It is well suited to row crops if drained. Most of the acreage is woodland.

About three-fourths of the Alligator soil is used for the commonly grown row crops and pasture plants. The rest is occupied by mixed hardwoods. Drainage is needed if row crops are grown.

CAPABILITY UNIT IVs-1

This unit consists of the Crevasse part of Crevasse and Bruno soils, an undifferentiated group of excessively drained, nearly level, nonacid soils that have a surface layer and subsoil of sand.

This soil is droughty. Permeability is rapid, and the available water capacity is low. The natural fertility is low.

Most of the acreage is used for pasture, small grain, soybeans, and cottonwood trees. Suitable pasture plants are bermudagrass, vetch, and white clover. Fertilizer is leached out readily, so it should be applied frequently in small amounts.

CAPABILITY UNIT VIe-1

This unit consists of moderately steep, well-drained, acid, slightly eroded to severely eroded soils of the Memphis series. These soils are on uplands. The surface layer is silt loam to heavy silt loam, and the subsoil is silty clay loam grading to silt loam with depth.

Permeability is generally moderate. The available water capacity is high, and the natural fertility is moderate. Runoff is rapid. The erosion hazard is severe. Permanent vegetation is needed to control erosion, encourage infiltration, and decrease runoff.

About 30 percent of the acreage is used for pasture. The rest is woodland. The commonly grown pasture plants and trees are well suited. Pastures should not be overgrazed.

CAPABILITY UNIT VIIe-1

This unit consists of moderately steep to steep, well-drained, acid and alkaline soils of the Memphis and Natchez series. These soils have a surface layer of silt loam or heavy silt loam. The Memphis soils have a subsoil of silty clay loam grading to silt loam with depth. The Natchez soils have a subsoil of silt loam.

Permeability is generally moderate. The available water capacity is high. The Memphis soils have moderate natural fertility, and the Natchez soils have high natural fertility.

This unit is not suited to pasture or row crops. Most of it is in upland hardwoods and should be kept in trees for control of runoff and erosion. Protection from fire is needed.

CAPABILITY UNIT VIIe-3

This unit consists of Gullied land-Memphis complex, 8 to 40 percent slopes. Gullied land is eroded to the extent that only narrow isolated areas of the original soils remain between the gullies. It is low in natural fertility and variable in permeability and available water capacity. The Memphis soils are moderate in permeability, moderate in natural fertility, and high in available water capacity.

This complex is not suited to row crops and pasture. It is suited to pine trees, and within the past 15 years many areas have been planted to pines. The woodland should be protected from fire and grazing.

Estimated Yields

Table 2 gives estimates of average acre yields of the principal crops grown in Tallahatchie County, under high-level management but without irrigation. The following are presumed to be part of the management system: (1) application of lime and fertilizer according to the results of soil tests; (2) proper tillage and proper use of crop residue; (3) planting of suitable varieties of crops; (4) use of suitable cropping systems; and (5) other conservation practices, as needed.

The estimates of yields were made by agronomists, soil scientists, and others who have had experience with crops and soils in this county. Yield data obtained in experiments were used as a basis, if available. Such data were adjusted to allow for differences in slope and differences in management. Estimates for soils for which no data had been obtained were based on data for similar soils. No estimates are given for crops not suited to the particular soil.

TABLE 2.—*Estimated average acre yields of principal crops*

[Dashes mean that the crop is not commonly grown on the soil or that data are not available for making an estimate]

Soil	Cotton	Corn	Soybeans	Oats	Rice	Pasture			Bermudagrass for hay
						Common bermudagrass	Fescue or fescue and legumes	Coastal bermudagrass and legumes	
	Lb. of lint	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Tons*
Alligator clay, 0 to 2 percent slopes	475	45	35	55	75	210	255	265	3.5
Alligator clay, depressional	200		30	30	70	150		210	3.0
Alligator silty clay loam, 0 to 2 percent slopes	500	50	30	50	75	210	255	260	3.5
Calhoun silt loam	475	45	25	50		185	190		2.5
Calhoun-Bonn complex	450	45	20	45	65	185	190		2.5
Calloway silt loam, 0 to 3 percent slopes	550	55	35	55		195	255	230	3.2
Cascilla silt loam, 0 to 3 percent slopes	750	95	40	55		250	210	285	4.1
Collins silt loam	750	95	35	60		265	215	300	5.0
Collins silt loam, clayey subsoil variant	650	85	32	60		240	200	300	4.5
Crevasse and Bruno soils [2]	325	25		40		105		150	
Dubbs very fine sandy loam, 0 to 2 percent slopes	800	85	30	60		255	300	295	5.0
Dubbs very fine sandy loam, 2 to 5 percent slopes	750	75	25	55		250	300	295	5.0
Dundee silt loam, 0 to 2 percent slopes	750	85	28	55		255	295	290	5.0
Dundee silt loam, 2 to 5 percent slopes	650	75	25	55		255	295	290	5.0
Dundee silty clay loam, 0 to 2 percent slopes	650	55	30	55		250	280	280	5.0
Dundee silty clay loam, 2 to 5 percent slopes	625	45	25	55		250	280	280	5.0
Dundee soils, 5 to 8 percent slopes	500	40	25	55		240	255	300	
Dundee and Tensas silt loams, 0 to 3 percent slopes [2]	625	60	30	55	65	225	265	225	4.5
Falaya silt loam	650	75	35	60		135	195	240	4.5
Falaya-Waverly association [2]	500	50	35	55		120	180	225	3.5
Forestdale silty clay loam, 0 to 3 percent slopes	550	50	35	50	75	220	270	230	4.5
Forestdale silt loam, depressional	500	55	25		70	220		235	4.5
Grenada silt loam, 0 to 2 percent slopes	600	55	35	65		180	190	270	3.0
Grenada silt loam, 2 to 5 percent slopes, eroded	600	50	35	60		180	190	270	3.0
Grenada silt loam, 2 to 8 percent slopes, severely eroded	450	40	20	50		150	160	180	2.0
Gullied land-Memphis complex, 8 to 40 percent slopes									
Leverett silt loam, 0 to 2 percent slopes	625	70	35	60		185	195	250	3.5
Leverett silt loam, 2 to 5 percent slopes	600	65	35	60		185	195	250	3.5
Loring silt loam, 0 to 2 percent slopes	750	85	35	72		195	210	300	4.0
Loring silt loam, 2 to 5 percent slopes, eroded	735	80	32	70		195	200	300	4.0
Loring silt loam, 5 to 8 percent slopes, eroded	650	70	30	67		180	190	265	4.0
Loring silt loam, 8 to 12 percent slopes, eroded	500	55	26	65		160	165	240	3.5
Memphis silt loam, 0 to 2 percent slopes	775	82	35	75		190	225	280	4.1
Memphis silt loam, 2 to 5 percent slopes, eroded	750	80	32	72		190	225	280	4.0
Memphis silt loam, 5 to 8 percent slopes, eroded	675	75	28	70		180	220	250	4.0
Memphis silt loam, 8 to 12 percent slopes, eroded	550	55	28	60		175	165	245	3.0
Memphis silt loam, 5 to 12 percent slopes, severely eroded	500	50	20	55		170	165	235	3.0
Memphis silt loam, 12 to 17 percent slopes						170	165	240	
Memphis silt loam, 12 to 17 percent slopes, severely eroded						165	160	230	
Memphis silt loam, 17 to 40 percent slopes						150	155	185	
Memphis silt loam, 17 to 40 percent slopes, severely eroded						140	145	175	
Memphis-Natchez complex, 17 to 40 percent slopes									
Rosebloom silt loam	475	40	30	55	65	150	160		
Sharkey clay	475	50	40	50	75	210	255	265	3.5
Tippo silt loam, 0 to 2 percent slopes	550	50	35	55		180	245	265	3.2
Tutwiler very fine sandy loam, 0 to 3 percent slopes	700	70	32	55		210	225	290	3.5
Tutwiler-Bruno complex, 0 to 5 percent slopes	450	45	25	50		180		260	3.0
Vicksburg silt loam	800	85	35	75		260	255	300	5.0
Vicksburg and Bruno soils [2]	600	75	25	50		220	175	260	4.0
Waverly silt loam	475	40	30	50	65	190	225		

[1] Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of animal units carried per acre multiplied by the number of days the pasture can be grazed during a year without injury to the sod. An acre of pasture that provides 30 days of grazing for two cows has a carrying capacity of 60 cow-acre-days.

[2] The composition of these mapping units is more variable than that of the other mapping units in the county. Because of this, yields may vary more from field to field than is the case with other mapping units.

Use of the Soils for Woodland [2]

About 150,700 acres in Tallahatchie County is commercial woodland. This is a little more than a third of the total acreage (*8*).[3] Saw logs and pulpwood are the principal wood products. In 1962, the saw-log production totaled about 10.6 million board feet (International ¼-inch rule) (*3*). Pulpwood production in 1963 totaled 2,564 standard cords. Miscellaneous wood products in 1962 totaled 28,000 cubic feet. The timber harvested consisted predominantly of hardwoods.

In 1957, the forest stands of the county contained 46.6 million cubic feet of growing stock and would have yielded 145.7 million board feet of sawtimber (*3*).

Forest types

Four major forest types, as "forest type" is defined by the Society of American Foresters (*5*), are represented in Tallahatchie County (*8*). Most extensive of the four is the bottom-land hardwood type, which occupies 90,000 acres. Part of this acreage is the oak-gum-cypress subtype, and part is the elm-ash-cottonwood subtype. The oak-hickory type occupies 49,500 acres, the oak-pine type 6,700 acres, and the loblolly-shortleaf pine type 4,500 acres.

The bottom-land hardwoods type is in the western and central parts of the county, mainly in soil associations 1, 2, and 7. Stands that are 50 percent or more tupelo, blackgum, sweetgum, oak, or southern cypress, singly or in combination, and are less than 25 percent pine, are classified as the oak-gum-cypress subtype. Common associates in these stands are cottonwood, willow, ash, elm, hackberry, and maple (*6*). Stands that are 50 percent or more elm, ash, or cottonwood, singly or in combination, and are less than 25 percent pine, are classified as the elm-ash-cottonwood subtype. Common associates in these stands are willow, sycamore, beech, and maple (*6*).

The oak-hickory type is in the northeastern and southeastern parts of the county, mainly in the eroded uplands of soil association 6 and on alluvial areas in association 4. Stands of this type are 50 percent or more upland oak and hickory, singly or in combination, and less than 25 percent pine. Common associates in these stands are yellow-poplar, elm, maple, and black walnut.

The oak-pine type extends from the southeastern corner of the county to the east-central part. It is mainly in the eroded uplands of soil association 6 and on alluvial areas in soil association 4. Stands classified as oak-pine are 50 percent or more hardwoods, mostly upland oak, and 25 to 49 percent southern pines. Common associates in these stands are gum, hickory, and yellow-poplar.

The loblolly-shortleaf pine type is of minor importance in this county. It is intermingled with oak-pine and oak-hickory stands on uplands throughout the eastern third of the county. Stands of this type are 50 percent or more loblolly pine, shortleaf pine, or other southern yellow pines, except longleaf and slash pine. Common associates in these stands are oak, hickory, and gum.

Woodland suitability groups

To assist owners of woodland and others interested in planning the management of woodland, the soils of this county have been placed in 17 woodland suitability groups, each of which is described separately in this section. The names of the soil series represented are listed in the description of each group, but this does not necessarily mean that all the mapping units of those series are in the particular group. The woodland suitability classification of each soil can be found in the "Guide to Mapping Units."

Important factors considered in grouping the soils according to woodland suitability are the following:

Species to favor in management refers to a rating of tree species as to their natural occurrence and their adaptability and ability to produce quality forest products.

Species to favor in planting refers to the choice of species for planting that depends on the past use and condition of the soil.

Site index is the average height, in feet, that free-growing dominant trees will attain at 50 years of age. All species except cottonwood are so rated. The site index for cottonwood is based on the total height at 30 years of age. Site indexes provide a basis for comparing, analyzing, and projecting rates of tree growth and yields of forest products. It is quite possible to have a specific site within a soil that will be above or below the range given. This may be due to position, abnormal water table, or other factors that affect a specific site.

Plant competition is the rate or speed at which undesirable species invade different soil units. It is also referred to as "brush encroachment." Plant competition is directly affected by four conditions: (1) The natural fertility and topographic position of the soil; (2) the degree of erosion; (3) the length of time since the erosion has occurred; and (4) the length of time the soil has been protected from fire and harmful grazing. A rating of slight means that competition from undesirable plants is no special problem. A rating of moderate means that competition may delay regeneration but usually does not prevent the development of well-stocked stands. A rating of severe means that competition from other plants will likely prevent adequate regeneration of preferred species. Where competition is severe, the site needs careful preparation to insure regeneration.

Seedling mortality refers to the failure of seedlings to grow in a normal environment after adequate natural seeding has taken place or after suitable seedlings have been planted. It is affected by the kinds of soils and by other factors in the environment. A rating of slight means that trees ordinarily regenerate naturally in areas where there is sufficient seed, or that no more than 25 percent of the seedlings that are planted die. A rating of moderate means that trees ordinarily do not reseed naturally in numbers large enough for adequate restocking, or that 25 to 50 percent of the seedlings that are planted die. A rating of severe means that trees ordinarily do not reseed naturally, even where there are enough seeds, and that more than 50 percent of the seedlings that are planted die. Where seedling mortality is severe, seedlings need to be planted where the seeds do not grow,

[2] JOSEPH V. ZARY, woodland conservationist, Soil Conservation Service, assisted with this section.

[3] Italic numbers in parentheses refer to Literature Cited, page 57.

a special seedbed should be prepared, and special methods of planting need to be used to assure a full stand of trees.

Erosion hazard is the erosion potential of a soil in relation to average logging practices required for woodcrop production. A rating of slight means that the slope is slight and runoff is slow or very slow. A rating of moderate means that the loss of soil is moderate when runoff is not controlled and the cover of plants is not adequate to protect the soil. A rating of severe means that steep slopes, rapid runoff, slow infiltration, slow permeability, and past erosion, singly or in combination, may result in loss of large quantities of soil material.

Windthrow hazard depends on the development of tree roots and the ability of the soils to hold the roots firmly. A rating of slight means trees are firmly rooted and do not fall down in a normal wind. A rating of moderate means roots are large enough to hold the trees firmly except when the ground is excessively wet and the wind is strong. A rating of severe means roots do not give enough stability to prevent trees from blowing over when other trees around them have been cut down.

Equipment limitations depend on soil characteristics and topographic features that restrict or prohibit the use of regular tree-harvesting equipment. A rating of slight means that there is no special problem. A rating of moderate means that seasonal restrictions on the use of equipment last less than 3 months. A rating of severe means that seasonal restrictions on the use of equipment last more than 3 months or that special logging methods or equipment are needed.

WOODLAND SUITABILITY GROUP 1

This group consists of poorly drained, fine-textured soils of the Alligator and Sharkey series. These soils are on flood plains. They have a surface layer of clay and silty clay loam and a subsoil of clay. When the soils are dry, water intake is rapid because of the large cracks, but when they are saturated, it is very slow. The available water capacity is high.

These soils are capable of producing valuable hardwoods, among them green ash, baldcypress, eastern cottonwood, red maple, cherrybark oak, Nuttall oak, overcup oak, water oak, willow oak, common persimmon, sweetgum, and American sycamore. They are not suited to pine trees. The average site indexes of the important hardwood species at age 50 are as follows: cherrybark oak, 85 ± 5; willow oak and water oak, 75 ± 5; sweetgum, 80 ± 5. The average site index of eastern cottonwood at age 30 is 95 ± 5. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 240 for cherrybark oak, 155 for willow oak and water oak, 215 for sweetgum, and 420 for eastern cottonwood.

Plant competition is moderate to severe. Competing plants can be destroyed by spraying with chemicals, by clearing, or by disking. Desirable trees restock more readily if a suitable seedbed is prepared. Protection against fire and grazing is necessary. Seedling mortality is generally moderate on the silty clay loams and severe on the clays. The windthrow hazard is slight; individual trees can be expected to remain standing when released on all sides. Because water stands on the surface much of the time, conventional equipment can be used only 3 to 6 months each year.

The trees to be preferred for planting are green ash, baldcypress, eastern cottonwood, Nuttall oak, and sweetgum.

WOODLAND SUITABILITY GROUP 2

This group consists of well-drained to excessively drained, medium-textured and moderately coarse textured soils of the Tutwiler and Bruno series. These soils are on flood plains. They have a surface layer of sandy loam to very fine sandy loam and a subsoil of silt loam to loamy very fine sand and gravelly loamy sand. Permeability is moderately rapid to rapid. The available water capacity is moderate to low.

These soils are well suited to eastern cottonwood, cherrybark oak, Shumard oak, water oak, willow oak, sassafras, sweetgum, and American sycamore. The major hardwood species (cherrybark oak, water oak, willow oak, and sweetgum) all have average site indexes of 100 ± 5 at age 50. The average site index of eastern cottonwood at age 30 is 110 ± 5. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 410 for cherrybark oak, water oak, and willow oak, 430 for sweetgum, and 680 for cottonwood.

Plant competition is moderate to severe. Competing plants may delay regeneration, but usually they do not prevent the development of well-stocked stands. Because the soils are loose and sandy, there is a slight to moderate limitation on the use of equipment. Seedling mortality and the windthrow hazard are slight. The erosion hazard is only slight, because the slope is less than 5 percent.

The trees to be preferred for planting are eastern cottonwood, cherrybark oak, Shumard oak, sweetgum, and American sycamore.

WOODLAND SUITABILITY GROUP 3

This group consists of Alligator clay, depressional, a poorly drained, fine-textured soil of the flood plains. This soil has a surface layer and subsoil of clay. Permeability is slow. The available water capacity is high.

This soil is well suited to green ash, baldcypress, Nuttall oak, overcup oak, common persimmon, water tupelo, and black willow. It is not suited to pine trees.

The average site index of Nuttall oak and willow oak at age 50 is 85 ± 5 and of sweetgum, 80 ± 5. The average site index of eastern cottonwood at age 30 is 95 ± 5. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 240 for Nuttall oak and willow oak, 215 for sweetgum, and 420 for eastern cottonwood.

Plant competition is moderate to severe. Competing plants often prevent desirable trees from forming an adequate stand. These plants can be controlled by use of chemicals, by clearing, or by disking. The equipment limitation is severe. During rainy seasons, the use of equipment is limited for 3 to 6 months or even longer. Seedling mortality is severe because of long periods of flooding. The windthrow hazard is slight, and erosion is slight.

Trees to be preferred for planting are green ash, baldcypress, and Nuttall oak.

WOODLAND SUITABILITY GROUP 4

This group consists of medium-textured, moderately well drained to well drained soils of the Dubbs series. These soils are on old natural levees of the Mississippi River. They have a surface layer of very fine sandy loam and a subsoil of silty clay loam. The available water capacity is moderate. Permeability is moderate to moderately slow.

These soils are well suited to a number of very desirable hardwoods, among them eastern cottonwood, cherrybark oak, Nuttall oak, Shumard oak, swamp chestnut oak, water oak, willow oak, pecan, sassafras, sweetgum, American sycamore, and black tupelo.

The average site indexes of the important hardwood species at age 50 are as follows: cherrybark oak, 105 ± 5; water oak, willow oak, and sweetgum, 100 ± 5. The average site index of eastern cottonwood at age 30 is 110 ± 5. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 460 for cherrybark oak, 430 for sweetgum, 410 for water oak and willow oak, and 600 for eastern cottonwood.

Plant competition is moderate to severe, and it may prevent regeneration and retard initial growth of desirable species. Seedling mortality is slight to moderate. The limitation on the use of equipment is moderate. The erosion hazard is slight because the slope is less than 5 percent.

The trees to be preferred for planting are eastern cottonwood, cherrybark oak, Nuttall oak, Shumard oak, sweetgum, and American sycamore.

WOODLAND SUITABILITY GROUP 5

This group consists of medium-textured, somewhat poorly drained soils of the Dundee and Tensas series. These soils are on old natural levees of the Mississippi River. They have a surface layer of silt loam to silty clay loam and a subsoil of silty clay loam to silty clay. Permeability is moderately slow to slow. The available water capacity is moderate.

These soils support a variety of hardwoods, among them eastern cottonwood, cherrybark oak, Nuttall oak, Shumard oak, swamp chestnut oak, water oak, willow oak, pecan, sweetgum, American sycamore, and black tupelo. The site indexes of the principal species at age 50 are as follows: cherrybark oak and sweetgum, 95 ± 5; willow oak, 100 ± 5; and water oak, 90 ± 5. The average site index of eastern cottonwood at age 30 is 105 ± 5. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 345 for cherrybark oak, 370 for sweetgum, 410 for willow oak, 290 for water oak, and 590 for eastern cottonwood.

Plant competition is moderate. It may delay natural regeneration and slow down initial growth of desirable species. The limitation on the use of equipment is slight on slopes of 0 to 2 percent and moderate on slopes of 2 to 8 percent. The erosion hazard is slight because the slope is predominantly less than 5 percent. Seedling mortality is slight where the slope is 0 to 2 percent and moderate where the slope is 2 to 8 percent.

The trees to be preferred for planting are eastern cottonwood, cherrybark oak, Nuttall oak, Shumard oak, swamp chestnut oak, sweetgum, and American sycamore.

WOODLAND SUITABILITY GROUP 6

This group consists of moderately fine textured to medium-textured, poorly drained soils of the Forestdale series. These soils are on old natural levees of the Mississippi River. They have a surface layer of silty clay loam and silt loam and a subsoil of silty clay. Permeability is moderately slow to slow. The available water capacity is moderately high to high.

These soils support numerous hardwood species of commercial importance, mainly oaks. The major hardwood species are eastern cottonwood, cherrybark oak, Nuttall oak, overcup oak, swamp chestnut oak, water oak, willow oak, sweetgum, and American sycamore. Minor species include elm, water hickory, sugarberry, red maple, and common persimmon. The average site indexes of the principal species at age 50 are as follows: cherrybark oak, water oak, and sweetgum, 90 ± 5; willow oak, 85 ± 5. The average site index of eastern cottonwood at age 30 is 95 ± 5. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 290 for cherrybark oak and water oak, 240 for willow oak, 315 for sweetgum, and 420 for eastern cottonwood.

Plant competition is severe. Competing plants can be controlled by spraying with herbicides, by clearing, or by disking. The equipment limitation is moderate. Because of wetness, the use of equipment is restricted for a period of less than 3 months each year. Seedling mortality is moderate because of flooding or wetness in low areas. The windthrow hazard is slight; individual trees can be expected to remain standing when released on all sides. The erosion hazard is slight because the slope is less than 3 percent.

The trees to be preferred for planting are eastern cottonwood, cherrybark oak, Nuttall oak, swamp chestnut oak, sweetgum, and American sycamore. Green ash, baldcypress, water tupelo, and black willow can be planted in depressions with good results.

WOODLAND SUITABILITY GROUP 7

This group consists of medium-textured, somewhat poorly drained, nearly level, loessal soils of the Calloway and Tippo series. These soils have a surface layer of friable silt loam and a subsoil of silt loam to silty clay loam. At a depth of about 15 to 24 inches is a fragipan 18 to 40 inches thick.

Permeability is generally moderate above the fragipan and slow to moderate within it. The available water capacity is moderate to low, and the natural fertility is moderate to low.

These soils are suitable for southern hardwoods, among them green ash, white ash, red maple, cherrybark oak, Nuttall oak, Shumard oak, swamp chestnut oak, water oak, white oak, and sweetgum. In addition, these soils are suitable for pine. The average site indexes of the important species at age 50 are as follows: cherrybark oak, Nuttall oak, Shumard oak, swamp chestnut oak, and white oak, 95 ± 5; water oak, 80 ± 5; sweetgum, 95 ± 5; loblolly pine, 95 ± 8; shortleaf pine, 87 ± 5. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 290 for cherrybark oak, Nuttall oak, Shumard oak, swamp chestnut oak, and white oak, 195 for water oak, 370 for

sweetgum, 660 for loblolly pine, and 610 for shortleaf pine.

Plant competition is slight to moderate. The limitation on the use of equipment is slight to moderate, because some of the low, flat areas stay wet from 1 month to 3 months late in winter and early in spring. Seedling mortality is slight. In years of normal rainfall, less than 25 percent of the planted trees die. The windthrow hazard is slight to moderate because the fragipan near the surface restricts the root zone and limits the moisture supply. The erosion hazard is slight because the slope is less than 3 percent.

The trees to be preferred for planting are cherrybark oak, Shumard oak, sweetgum, loblolly pine, and shortleaf pine.

WOODLAND SUITABILITY GROUP 8

This group consists of medium-textured, moderately well drained soils of the Collins series. These soils are on flood plains. They have a surface layer and subsoil of silt loam. Minor areas have a clayey subsoil. Permeability is moderate to moderately slow. The available water capacity is high.

These soils are particularly productive of many important southern hardwoods. The species that are most common and that ought to be favored in management are eastern cottonwood, cherrybark oak, Shumard oak, water oak, sweetgum, American sycamore, and yellow-poplar. Less plentiful but of considerable commercial value are American basswood, black cherry, sugarberry, southern magnolia, Nuttall oak, southern red oak, swamp chestnut oak, white oak, willow oak, common persimmon, sassafras, black tupelo, loblolly pine, and shortleaf pine. The average site indexes of the major species at age 50 are as follows: cherrybark oak, 110 ± 5; water oak and willow oak, 105 ± 5; sweetgum, 110 ± 5; loblolly pine, 100 ± 5; shortleaf pine, 74 ± 6. The average site index of eastern cottonwood at age 30 is 115 ± 5. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 520 for cherrybark oak, 460 for water oak and willow oak, 570 for sweetgum, 740 for loblolly pine, 440 for shortleaf pine, and 750 for eastern cottonwood.

Plant competition is moderate for the native hardwoods and severe for plantings. It may delay regeneration and slow down initial growth, and it may prevent planted seedlings from becoming established. The equipment limitation is slight. Normally, these soils are not wet for more than 3 months of the year. This wet period occurs late in winter and early in spring. Seedling mortality and the windthrow hazard are slight. The erosion hazard is slight because the slope is less than 2 percent.

The trees to be preferred for planting are eastern cottonwood, cherrybark oak, Nuttall oak, Shumard oak, swamp chestnut oak, sweetgum, American sycamore, and yellow-poplar. Loblolly pine can be planted in old fields, but hardwoods usually reclaim the site.

WOODLAND SUITABILITY GROUP 9

This group consists of somewhat poorly drained, acid soils of the Falaya and Waverly series. These soils are on flood plains. They have a surface layer and subsoil of silt loam. Permeability is moderate, and the available water capacity is moderate to high.

These soils are very productive and support great numbers of important commercial hardwood trees, among them green ash, white ash, baldcypress, eastern cottonwood, red maple, cherrybark oak, Nuttall oak, overcup oak, swamp chestnut oak, water oak, willow oak, common persimmon, sweetgum, and American sycamore. Of equal commercial importance but less plentiful are sugarberry, southern magnolia, Shumard oak, white oak, and yellow-poplar. The average site indexes of the important hardwood species at age 50 are as follows: cherrybark oak, 100 ± 5; water oak and willow oak, 95 ± 5; sweetgum, 105 ± 5. Loblolly pine has a site index of 103 ± 6 at age 50, and shortleaf pine has a site index of 85 ± 5. The average site index of eastern cottonwood at age 30 is 110 ± 5. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 410 for cherrybark oak, 350 for water oak and willow oak, 500 for sweetgum, 790 for loblolly pine, 580 for shortleaf pine, and 690 for eastern cottonwood.

Plant competition is moderate for the native hardwoods and severe for plantings. In some cases plant competition prevents desirable species from becoming established, delays regeneration, and slows down initial growth. The equipment limitation is moderate to severe because of excess surface water or flooding late in winter and early in spring. Normally, the limitation period is not more than 3 to 6 months long. Seedling mortality is slight to moderate because of flooding or wetness. The windthrow hazard is moderate when the soil is wet and the winds are high. The erosion hazard is slight because the slope is less than 2 percent.

The trees to be preferred for planting are eastern cottonwood, cherrybark oak, Nuttall oak, swamp chestnut oak, sweetgum, American sycamore, and yellow-poplar. Loblolly pine and shortleaf pine can be planted in abandoned fields, but competition from hardwoods is likely to be severe.

WOODLAND SUITABILITY GROUP 10

This group consists of nearly level, medium-textured, moderately well drained soils of the Grenada series. These soils have a surface layer of friable silt loam and a subsoil of silt loam to heavy silt loam. At a depth of about 22 to 26 inches is a fragipan, 36 inches or more thick. The pan restricts the root zone and limits the amount of moisture available to plants.

Permeability is moderate above the fragipan and slow within it. The available water capacity and natural fertility are moderate.

These soils are not nearly so well suited to high-value hardwoods as are the soils of woodland suitability groups 8 and 9. The major species on these soils are cherrybark oak, Shumard oak, white oak, and sweetgum. Less plentiful are American basswood, swamp chestnut oak, water oak, American sycamore, loblolly pine, and shortleaf pine. The average site indexes of the major species at age 50 are as follows: cherrybark oak, 95 ± 5; sweetgum, 90 ± 5; water oak, 85 ± 5; loblolly pine on ridges and upper slopes, 80 ± 7; loblolly pine on middle and lower slopes, 90 ± 7; shortleaf pine, 64 ± 7. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is

350 for cherrybark oak, 315 for sweetgum, 240 for water oak, 440 for loblolly pine on ridges and upper slopes, 580 for loblolly pine on middle and lower slopes, and 330 for shortleaf pine.

Plant competition is slight for the native hardwoods and moderate for plantings. The equipment limitation is slight. Seedling mortality is slight to moderate because of the limited available moisture capacity. The windthrow hazard is slight to moderate because the fragipan prevents trees from rooting deeply. The erosion hazard is slight where the slope is less than 5 percent and moderate where the slope is 5 to 8 percent.

The trees to be preferred for planting are cherrybark oak, sweetgum, yellow-poplar, loblolly pine, and shortleaf pine. Loblolly pine is especially suitable for planting on eroded sites.

WOODLAND SUITABILITY GROUP 11

This group consists of nearly level, poorly drained soils of the Calhoun and Bonn series. These soils are on flood plains and low terraces. They have a surface layer of silt loam and a subsoil of heavy silt loam. Permeability is moderate to slow. The available water capacity is generally low to moderate during the crop-growing season, and the water table is high during periods of heavy rain.

These soils support a few highly desirable species of southern hardwoods, among them cherrybark oak, Shumard oak, water oak, white oak, and sweetgum. Nuttall oak and swamp chestnut oak are less common but should be favored in management. Green ash, red maple, and willow oak are often associated with these hardwoods but are not favored in management. There are a few loblolly pines and shortleaf pines. The average site indexes of the principal species at age 50 are as follows: cherrybark oak and sweetgum, 85 ± 5; water oak, 75 ± 5; loblolly pine, 83 ± 9; shortleaf pine, 90 ± 3. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 240 for cherrybark oak, 155 for water oak, 260 for sweetgum, 400 for loblolly pine, and 650 for shortleaf pine.

Plant competition is slight for the native hardwoods and moderate for plantings. The equipment limitation is moderate to severe. In some places these soils are ponded for a considerable length of time following heavy rains. Seedling mortality is moderate to severe. Regeneration cannot be relied upon for restocking. The windthrow hazard is moderate because of the shallowness of the soil and because of the high water table following heavy rains. The erosion hazard is slight because the slope is less than 2 percent.

The trees to be preferred for planting are cherrybark oak, Shumard oak, loblolly pine, shortleaf pine, and sweetgum.

WOODLAND SUITABILITY GROUP 12

This group consists of well-drained to moderately well drained soils of the Leverett and Loring series. These soils are on uplands and older flood plains. They have a surface layer of silt loam, a subsoil of silt loam to heavy silt loam, and a weak fragipan at a depth of 25 to 28 inches. The slope range is 0 to 12 percent. Permeability is moderate above the fragipan but moderately slow within the fragipan. The available water capacity is high.

These soils are productive of several important commercial hardwood species, among them cherrybark oak, Shumard oak, white oak, sweetgum, and yellow-poplar. Associated with these but of less importance are several of the hickories, southern red oak, swamp chestnut oak, water oak, common persimmon, black tupelo, loblolly pine, and shortleaf pine. The average site indexes of the important species are as follows: cherrybark oak, 100 ± 5; water oak, 85 ± 5; sweetgum, 87 ± 2; loblolly pine on ridges and upper slopes, 85 ± 5; loblolly pine on middle and lower slopes, 95 ± 9; shortleaf pine on ridges and upper slopes, 63 ± 7; shortleaf pine on middle and lower slopes, 74 ± 8. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 410 for cherrybark oak, 240 for water oak, 280 for sweetgum, 510 for loblolly pine on ridges and upper slopes, 660 for loblolly pine on middle and lower slopes, 320 for shortleaf pine on ridges and upper slopes, and 435 for shortleaf pine on middle and lower slopes.

Plant competition is moderate for the native hardwoods and severe for plantings. Competing plants often delay natural regeneration and impede the growth of desirable species. The limitation on the use of equipment is slight. Seedling mortality is slight. Generally, less than 25 percent of planted stock dies. The windthrow hazard is slight. The erosion hazard is slight where the slope is 0 to 2 percent and moderate where the slope is 2 to 12 percent. Care should be taken in picking locations for haul roads and skid trails.

The trees to be preferred for planting are cherrybark oak, Shumard oak, sweetgum, yellow-poplar, loblolly pine, and shortleaf pine. Loblolly pine is especially suitable for planting in eroded areas.

WOODLAND SUITABILITY GROUP 13

This group consists of deep, well-drained, medium-textured soils of the Cascilla, Memphis, and Natchez series. The slope range is 0 to 40 percent. Permeability is moderate. The available water capacity is moderate to high.

These soils support a wide variety of important hardwood species. Several of the most highly prized hardwoods attain their peak in site index and quality on the steep middle and lower slopes. Hardwood species that occur commonly on middle and lower slopes and less abundantly on ridges and upper slopes are green ash, white ash, American basswood, black cherry, southern magnolia, cherrybark oak, Shumard oak, southern red oak, water oak, white oak, sweetgum, black tupelo, and yellow-poplar. These species should be favored in management. Less abundant but nevertheless to be favored in management are eastern cottonwood, swamp chestnut oak, willow oak, common persimmon, sassafras, and American sycamore. A few loblolly pines and shortleaf pines grow on ridges, on upper slopes, and on eroded sites.

On the soils having a slope range of 0 to 17 percent, the site indexes of the principal species at age 50 are as follows: cherrybark oak, 100 ± 5; water oak, 85 ± 5; sweetgum, 90 ± 5; loblolly pine on ridges and

upper slopes, 85 ± 5; loblolly pine on middle and lower slopes, 95 ± 9; shortleaf pine on ridges and upper slopes, 63 ± 7; shortleaf pine on middle and lower slopes, 71 ± 8. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 410 for cherrybark oak, 240 for water oak, 315 for sweetgum, 510 for loblolly pine on ridges and upper slopes, 660 for loblolly pine on middle and lower slopes, 320 for shortleaf pine on ridges and upper slopes, and 400 for shortleaf pine on middle and lower slopes.

The trees to be preferred for planting are cherrybark oak, Shumard oak, sweetgum, yellow-poplar, loblolly pine, and shortleaf pine.

On the soils having a slope range of 17 to 40 percent slopes, the site index of eastern cottonwood at age 30 is 105 ± 5. The site indexes of other important species at age 50 are as follows: cherrybark oak, 115 ± 5; water oak and willow oak, 100 ± 5; sweetgum, 110 ± 5; loblolly pine, 100 ± 5; shortleaf pine, 85 ± 5. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 590 for eastern cottonwood, 570 for cherrybark oak, 410 for water oak and willow oak, 565 for sweetgum, 740 for loblolly pine, and 580 for shortleaf pine.

The trees to be preferred for planting are cherrybark oak, Shumard oak, swamp chestnut oak, sweetgum, American sycamore, yellow-poplar, loblolly pine, and shortleaf pine. Loblolly pine is the best choice for planting on eroded soils.

Plant competition is slight to moderate. Competing plants may delay or prevent regeneration of preferred species in some areas. The equipment limitation is slight where the slope is 0 to 12 percent, moderate where the slope is 12 to 17 percent, and severe where the slope is 17 to 40 percent. Care should be taken in picking locations for roads and skid trails in steep and gullied areas. Seedling mortality is slight to severe, and open areas should be replanted. The windthrow hazard is slight to moderate. The erosion hazard is severe where the slope is steep.

WOODLAND SUITABILITY GROUP 14

This group consists of nearly level, well-drained soils of the Vicksburg series. These soils are on flood plains and in upland drainageways. Permeability is moderate. The available water capacity is high.

These soils produce excellent hardwoods. Eastern cottonwood, cherrybark oak, Shumard oak, water oak, sweetgum, American sycamore, and yellow-poplar are abundant and are favored in management. Equally desirable but less abundant are American basswood, black cherry, sugarberry, southern magnolia, Nuttall oak, southern red oak, swamp chestnut oak, white oak, willow oak, common persimmon, sassafras, and black tupelo. The average site index of eastern cottonwood at age 30 is 115 ± 5. The site indexes of the other important southern hardwoods at age 50 are as follows: cherrybark oak and sweetgum, 110 ± 5; water oak and willow oak, 105 ± 5. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 790 for eastern cottonwood, 570 for sweetgum, 530 for cherrybark oak, and 460 for water oak and willow oak.

Plant competition is moderate for the native hardwoods and severe for plantings. The equipment limitation is slight. Seedling mortality is slight. The windthrow hazard is slight to moderate. Although the root zone is good, trees may be blown over during heavy rains and high winds. The erosion hazard is slight because the slope is less than 2 percent.

The trees to be preferred for planting are eastern cottonwood, cherrybark oak, Shumard oak, sweetgum, American sycamore, and yellow-poplar.

WOODLAND SUITABILITY GROUP 15

This group consists of poorly drained soils of the Rosebloom and Waverly series. These soils have a surface layer and subsoil of silt loam to silty clay loam. They have a slope range of 0 to 2 percent and are subject to flooding. Permeability is moderate to moderately slow, and the water table is high during periods of heavy rain. The available water capacity is moderate to high, and the natural fertility is moderate to low.

These soils are well suited to a wide variety of southern hardwoods. Species that are abundant and that should be favored in management are green ash, white ash, baldcypress, eastern cottonwood, red maple, cherrybark oak, Nuttall oak, overcup oak, swamp chestnut oak, water oak, willow oak, common persimmon, sweetgum, and American sycamore. Species that are less abundant but should nevertheless be favored in management are sugarberry, southern magnolia, Shumard oak, white oak, and yellow-poplar. The average site indexes of the major species at age 50 are as follows: cherrybark oak and water oak, 90 ± 5; willow oak, 85 ± 5; sweetgum, 95 ± 5; and loblolly pine, 94 ± 9. The site index of eastern cottonwood at age 30 is 100 ± 5. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 290 for cherrybark oak and water oak, 240 for willow oak, 370 for sweetgum, 640 for loblolly pine, and 500 for eastern cottonwood.

Plant competition is moderate for the native hardwoods and severe for plantings. It prevents desirable species from becoming established, delays regeneration, and slows initial growth. The equipment limitation is severe because excess surface water stands on these soils in winter and early in spring, for a period of 6 to 8 months. Seedling mortality is moderate to severe because frequent flooding kills seedlings. The windthrow hazard is moderate when the soils are wet and the wind is high. The erosion hazard is slight because the slope is less than 2 percent.

Trees to be preferred for planting are baldcypress, green ash, eastern cottonwood, Nuttall oak, sweetgum, and American sycamore. Loblolly pine can be planted in open and abandoned fields, but it will be subjected to severe competition from hardwoods.

WOODLAND SUITABILITY GROUP 16

This group consists of nearly level, excessively drained soils of the Crevasse and Bruno series. These soils occur where stream channels have filled and splayed out. They have a surface layer of fine sandy loam to sand and a subsoil predominantly of sand and loamy sand. Permeability is rapid. The available water capacity is low.

These soils are well suited to a number of commercially important hardwoods. Among those common on Crevasse soils are eastern cottonwood, sugarberry, pecan, and American sycamore. Less common are green ash, silver

maple, and sweetgum. Species common on the Bruno soils are eastern cottonwood, cherrybark oak, Shumard oak, water oak, sweetgum, American sycamore, and yellow-poplar. Less common are American basswood, black cherry, sugarberry, southern magnolia, Nuttall oak, southern red oak, swamp chesnut oak, white oak, willow oak, common persimmon, sassafras, and black tupelo. All of these species should be favored in management. The average site indexes at age 50 are as follows: cherrybark oak and willow oak, 90 ± 5; sweetgum, 95 ± 5. The average site index of eastern cottonwood at age 30 is 115 ± 5. The average annual growth per acre in board feet (Doyle rule) in well-stocked, even-aged, managed stands is 290 for cherrybark oak and willow oak, 370 for sweetgum, and 790 for eastern cottonwood.

Plant competition is moderate. Desirable trees restock more readily if competing shrubs and vines are controlled. The limitation on the use of equipment is moderate. Flooding prevents the use of machinery for 1 to 3 months each year. The use of some equipment is limited because these soils are loose and sandy. Seedling mortality is moderate to severe because of flooding. The windthrow hazard is slight to moderate. Although the root zone is good, trees may be blown over during periods of heavy rains and high winds. The erosion hazard is slight because the slope is less than 2 percent.

The trees to be preferred for planting are cottonwood, cherrybark oak, willow oak, and sweetgum.

WOODLAND SUITABILITY GROUP 17

This group consists of deep, well-drained, medium-textured, severely eroded soils of the Memphis series. These soils are on uplands. They have a slope range of 5 to 40 percent. Infiltration is slow, and permeability is moderate. The available water capacity is moderate to high.

Pine grows much better than hardwoods on these severely eroded soils.

Plant competition is slight. The equipment limitation is slight where the slope is 5 to 12 percent and moderate to severe where the slope is 12 to 40 percent. Care should be taken in picking locations for roads and skid trails and in selecting logging equipment. Seedling mortality is moderate. Some seedlings die if the soil dries out. Openings should be replanted. The windthrow hazard is slight to moderate. The erosion hazard is severe.

Loblolly pine is to be preferred for planting.

In Gullied land-Memphis complex, 8 to 40 percent slopes, the soils are so severely eroded that production and management of hardwoods are just about impossible. No site index or annual growth data are available. Erosion can be checked by planting loblolly pine, which survives even under unfavorable conditions, grows rapidly, and casts litter that helps to stabilize the soil.

Use of the Soils in Engineering

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, facilities for water storage, erosion control structures, drainage systems, and sewage disposal systems. Among the properties most important to engineers are permeability to water, shear strength, compaction characteristics, soil drainage, shrink-swell characteristics, grain size, plasticity, and reaction. Depth to the water table, depth to bedrock, and topography are also important.

Information about the significant properties of the soils of this county and interpretations of these properties in terms of engineering uses are given in tables 3 and 4. This information can be used by engineers, along with information in other parts of the survey, to—

1. Make studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Make preliminary estimates for use in the planning of agricultural drainage systems, farm ponds, irrigation systems, and diversion terraces.
3. Make preliminary evaluations that will aid in selecting highway, airport, pipeline, and cable locations and in planning detailed investigations at the selected locations.
4. Locate probable sources of gravel and other construction materials.
5. Correlate performance of engineering structures with soil mapping units to develop information that will be useful in designing and maintaining certain engineering practices and structures.
6. Determine the suitability of soil mapping units 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 making maps and reports that can be used readily by engineers.
8. Develop other preliminary estimates for construction purposes pertinent to the particular area.

With the use of the soil map for identification, the interpretations in this section can be useful for many purposes. 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 depth of layers here reported. Even in such situations, however, the soil map is useful for planning more detailed field investigations and for suggesting the kind of problems that can be expected.

Some of the terms used by soil scientists may be unfamiliar to engineers, and some words, for example, clay, silt, and sand, have special meanings in soil science. These and other special terms used are defined in the Glossary.

Engineering classification systems

Two systems of classifying soils are in general use among engineers. Most highway engineers classify soil materials according to the AASHO system (*1*). In this system soil materials are classified in seven principal groups. The groups range from A–1, which consists of gravelly soils of high bearing capacity, to A–7, which consists of clay soils that have low strength when wet. Within each group, the relative engineering value of the soil material is indicated by a group index number. Group indexes range from 0 for the best material to 20 for the poorest. This group index number is not included in all engineering data.

TABLE 3.—*Estimated*

Soil series and map symbols	Depth to seasonal high water table	Flood hazard	Depth from surface	Classification: Dominant USDA texture
			Inches	
Alligator: AcA, Ad, AsA	0 to 15 inches for 1 to 4 months each year.	More than once every year for 2 days to 2 months.	0–48	Clay
Bonn	0 to 15 inches for 1 to 4 months each year.	More than once every year for 7 days to 1 month.	0–11 11–60	Silt loam Silt loam
Bruno	30 to 60 inches for 1 to 2 months each year.	More than once every year for 7 days to 3 months.	0–10 10–14 14–43	Fine sandy loam to sand Silt loam Loamy sand stratified with coarser textured and finer textured material.
Calhoun: Ca, Cb For Bonn part of Cb, see Bonn series.	0 to 15 inches for 1 to 4 months each year.	More than once every year for 7 days to 1 month.	0–14 14–30 30–48	Silt loam Silt loam Silt loam
Calloway: ClA	15 to 30 inches for 1 to 3 months each year.	Once in 1 to 5 years for 7 days to 1 month.	0–24 24–52 52–60	Silt loam Silty clay loam (fragipan) Silt loam (fragipan)
Cascilla: CmA	72 inches+	None.	0–46	Silt loam
Collins:				
Cn	30 to 60 inches for 1 to 2 months each year.	Once in 1 to 5 years for 2 to 7 days.	0–48	Silt loam
Co	30 to 60 inches for 1 to 2 months each year.	Once in 1 to 5 years for 2 to 7 days.	0–29 29–46	Silt loam Silty clay or clay
Crevasse: Cs For Bruno part, see Bruno series.	60 to 120 inches for 1 to 2 months each year.	Once in 1 to 2 years for 1 to 3 months.	0–48	Sand
Dubbs: DbA, DbB	48 inches+	None.	0–5 5–23 23–50	Very fine sandy loam Silty clay loam Silt loam or loam
Dundee: DdA, DdB, DeA, DeB, DnC, DtA. For Tensas part of DtA, see Tensas series.	30 to 60 inches for 1 to 2 months each year.	Once in 1 to 5 years for 2 to 7 days.	0–7 7–28 28–50	Silt loam Silty clay loam or silt loam Silt loam
Falaya: Fa, Fe For Waverly part of Fe, see Waverly series.	15 to 30 inches for 1 to 4 months each year.	Once in 1 to 3 years for 7 days to 1 month.	0–54	Silt loam
Forestdale:				
Fo	0 to 15 inches for 1 to 4 months each year.	More than once every year for 7 days to 1 month.	0–8 8–38 38–48	Silt loam Silty clay to silty clay loam Silty clay loam to heavy silt loam.
Fr	15 to 30 inches for 1 to 3 months each year.	Once a year for 7 days to 2 months.	0–6 6–26 26–44	Silty clay loam Silty clay Silty clay loam
Grenada: GrA, GrB2, GrC3	Perched water table for 1 to 3 months each year.	GrA: Once in 1 to 5 years for 2 to 7 days.	0–6 6–22 22–26 26–60	Silt loam Silt loam Silt loam Silt loam (fragipan)
Gullied land: GuF No estimates of properties of Gullied land. For properties of Memphis part of mapping unit, see Memphis series.				

properties of the soils

Classification—Continued		Percentage passing sieve—		Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
Unified	AASHO	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)					
				Inches per hour	*Inches per inch of soil*	*pH*		
CH or MH	A-7-5 or A-7-6	100	90-100	<0.2	0.19	5.1-6.0	Low	High.
ML	A-4	100	90-100	0.63-2.0	.23	6.1-7.8	High	Low.
CL	A-4, A-6	100	90-100	0.63-2.0	.23	7.9-8.4	Moderate	Moderate.
SM	A-2	100	15-30	2.5-10.0	.10	5.6-6.0	Very high	Low.
ML	A-4	100	85-100	0.63-2.0	.23	5.6-6.0	High	Low.
SM	A-2	100	15-30	2.5-10.0	.10	5.6-6.0	Very high	Low.
ML	A-4	100	90-100	0.63-2.0	.23	5.1-6.0	Moderate	Low.
CL	A-6 or A-7	100	90-100	<0.2	.21	5.1-5.5	Low	Moderate.
ML-CL	A-4 or A-6	100	90-100	0.63-2.0	.23	6.1-6.5	Moderate	Low.
ML	A-4	100	90-100	0.63-2.0	.21	5.1-5.5	High	Low.
CL	A-6 or A-7	100	90-100	<0.2	.21	5.1-5.5	Moderate	Moderate.
ML-CL	A-4 or A-6	100	90-100	0.2-0.63	.23	5.1-5.5	Moderate	Low.
ML-CL	A-4 or A-6	100	90-100	0.63-2.0	.21	5.1-6.0	High	Low.
ML, ML-CL	A-4	100	85-100	0.63-2.0	.23	5.1-5.5	High	Low.
ML	A-4	100	85-100	0.63-2.0	.23	5.1-5.5	High	Low.
CH or MH	A-7-5 or A-7-6	100	90-100	<0.2	.19	5.6-6.0	Low	High.
SP-SM	A-2	100	15-25	>6.3	.05	5.6-6.5	High	Low.
ML	A-4	100	80-95	0.63-2.0	.15	4.5-5.0	High	Low.
CL	A-6 or A-7	100	85-100	0.2-0.63	.21	4.5-5.0	Moderate	Moderate.
ML	A-4	100	85-100	0.63-2.0	.22	4.5-5.0	High	Low.
ML, ML-CL	A-4	100	80-95	0.63-2.0	.22	5.1-5.5	High	Low.
CL	A-6 or A-7	100	85-100	0.2-0.63	.21	5.1-5.5	Moderate	Moderate.
ML	A-4	100	85-100	0.63-2.0	.15	5.1-5.5	High	Low.
ML	A-4	100	85-100	0.63-2.0	.23	4.5-6.0	High	Low.
ML, CL	A-4, A-6	100	90-100	0.63-2.0	.22	5.1-6.0	High	Low.
CH or MH	A-6, A-7-5	100	90-100	0.2-0.63	.21	5.1-5.5	Low	High.
CH, CL	A-7, A-6	100	90-100	<0.2	.19	5.1-6.0	Moderate	Moderate.
CL	A-6	100	90-100	0.2-0.63	.21	5.6-6.0	Moderate	Moderate.
CL or CH	A-6, A-7-5	100	90-100	<0.2	.19	5.1-5.5	Low	High.
CL	A-6, A-7-5	100	90-100	0.2-0.63	.21	5.1-5.5	Moderate	Moderate.
ML	A-4	100	90-100	0.63-2.0	.23	7.4-7.8	High	Low.
CL	A-4, A-6	100	90-100	0.63-2.0	.23	5.1-5.5	Moderate	Moderate.
ML	A-4	100	90-100	0.2-0.63	.21	5.1-5.5	High	Low.
CL	A-4, A-6	100	90-100	<0.2	.21	5.1-5.5	Moderate	Moderate.

TABLE 3.—*Estimated properties*

Soil series and map symbols	Depth to seasonal high water table	Flood hazard	Depth from surface	Classification: Dominant USDA texture
			Inches	
Leverett: LeA, LeB	60 inches+	None.	0–28	Silt loam
			28–60	Silt to silt loam (fragipan in upper part).
Loring: LoA, LoB2, LoC2, LoD2	Perched water table for 1 to 2 months each year.	None.	0–7	Silt loam
			7–25	Silt loam or silty clay loam
			25–60	Silt loam (fragipan)
Memphis: MeA, MeB2, MeC2, MeD2, MeD3, MeE, MeE3, MeF, MeF3, MnF. For Natchez part of MnF, see Natchez series.	Undetermined	None.	0–8	Silt loam
			8–28	Silty clay loam
			28–60	Silt loam
Natchez	Undetermined	None.	0–60	Silt loam
Rosebloom: Ro	0 to 15 inches for 1 to 4 months each year.	More than once every year from 7 days to 2 months.	0–24	Silt loam
			24–48	Silty clay loam
Sharkey: Sh	0 to 15 inches for 1 to 4 months each year.	More than once a year for 2 days to 2 months.	0–50	Clay
Tensas	15 to 30 inches for 1 to 3 months each year.	Once a year for 5 days to 2 months.	0–5	Silt loam
			5–28	Silty clay loam or silty clay
			28–46	Silty clay loam
Tippo: TpA	15 to 30 inches for 1 to 3 months each year.	More than once a year for 1 to 2 months.	0–15	Silt loam
			15–60	Silt loam (fragipan in the upper part).
Tutwiler: TuA, TwB. For Bruno part of TwB, see Bruno series.	72 inches+	None.	0–24	Very fine sandy loam to loam.
			24–48	Loamy very fine sand
Vicksburg: Vc, Vk. For Bruno part of Vk, see Bruno series.	30 to 60 inches for 7 days to 1 month each year.	Once in 1 to 5 years for 2 days to 1 month.	0–55	Silt loam
Waverly: Wv	0 to 15 inches for 1 to 4 months each year.	More than once every year for 7 days to 2 months.	0–45	Silt loam

of the soils—Continued

Classification—Continued		Percentage passing sieve—		Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
Unified	AASHO	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)					
				Inches per hour	*Inches per inch of soil*	*pH*		
ML	A–4	100	90–100	0. 63–2. 0	. 23	5. 1–5. 5	High	Low.
ML–CL	A–4 or A–6	100	90–100	0. 05–0. 2	. 21	5. 1–5. 5	High	Low.
ML	A–4	100	90–100	0. 63–0. 2	. 23	5. 6–6. 5	High	Low.
CL	A–4 or A–6	100	90–100	0. 63–0. 2	. 23	5. 1–6. 0	Moderate	Moderate.
ML–CL	A–4 or A–6	100	90–100	0. 2 –0. 63	. 23	5. 1–6. 0	High	Low.
ML	A–4	100	90–100	0. 63–2. 0	. 23	5. 1–5. 5	High	Low.
CL	A–6, A–7	100	90–100	0. 63–2. 0	. 21	5. 1–5. 5	Moderate	Moderate.
ML, CL	A–4, A–6	100	90–100	0. 63–2. 0	. 23	5. 1–5. 5	High	Low.
ML–CL	A–4	100	90–100	0. 63–2. 0	. 23	5. 6–7. 8	High	Low.
ML–CL	A–4, A–6	100	85–100	0. 63–2. 0	. 23	4. 5–5. 0	High	Low.
CL	A–6 or A–7	100	85–100	0. 2–0. 63	. 21	4. 5–5. 0	Moderate	Moderate.
CH or MH	A–7–5 or A–7–6	100	90–100	<0. 2	. 19	5. 6–7. 3	Low	High.
ML	A–4	100	90–100	0. 63–2. 0	. 22	5. 1–5. 5	High	Low.
CH or MH	A–7–5	100	90–100	<0. 2	. 19	5. 1–5. 5	Low	High.
CL	A–7–6	100	90–100	0. 2–0. 63	. 21	5. 6–6. 0	Moderate	Moderate.
ML	A–4	100	85–100	0. 63–2. 0	. 23	5. 1–5. 5	High	Low.
ML–CL	A–6, A–4	100	85–100	0. 05–0. 2	. 21	4. 5–5. 5	Moderate	Moderate.
ML	A–4	100	70–85	0. 63–2. 0	. 22	4. 5–6. 0	High	Low.
ML	A–4	100	70–85	2. 0–6. 3	.14 or .08	4. 5–5. 0	High	Low.
ML	A–4	100	85–100	0. 63–2. 0	. 23	5. 1–5. 5	High	Low.
ML	A–4	100	85–100	0. 63–2. 0	. 23	5. 1–5. 5	High	Low.

TABLE 4.—*Interpretation of engineering*

Soil series and map symbols	Suitability as source of—			Suitability for winter grading	Soil features affecting—	
	Topsoil	Road subgrade	Road fill		Highway location	Dikes or levees
Alligator: AcA, Ad, AsA	Poor	Poor	Poor	Poor; clay texture.	Very plastic clay; high water table; flooding.	High shrink-swell potential.
Calhoun: Ca, Cb. Includes Bonn part of Cb.	Poor	Fair to poor.	Poor; unstable.	Poor; high water table.	High water table; seepage.	Unstable; can be used if moisture is properly controlled.
Calloway: ClA	Poor to fair; unstable.	Fair to poor.	Poor; unstable.	Poor; high water table caused by fragipan.	High water table; seepage.	Low to fair stability and strength; can be used if moisture is controlled.
Cascilla: CmA	Fair to good.	Fair to poor.	Fair to poor; easily eroded.	Poor; high erodibility.	Slopes easily eroded; soil properties fair.	Fair stability
Collins:						
Cn	Good	Fair to poor.	Fair; easily eroded.	Fair to poor; high water table.	Flooding; soil properties fair.	Low to fair stability; low shrink-swell potential.
Co	Upper 30 inches good; lower subsoil poor.	Fair to poor.	Fair to poor.	Fair to poor; high water table.	Flooding; plastic clay at depth of 30 inches.	Low to fair stability in upper part; high shrink-swell potential in lower part.
Crevasse and Bruno soils: Cs.	Fair to poor.	Good	Good	Fair; flooding.	Sandy texture; excessive drainage.	Rapid permeability; fair stability.
Dubbs: DbA, DbB	Good	Fair	Good	Good; old natural levees.	Old natural levees; soil properties fair.	High strength and stability.
Dundee: DdA, DdB, DeA, DeB, DnC.	Fair	Fair	Fair	Fair; low to moderate shrink-swell potential.	Old natural levees; soil properties fair.	Fair to high strength and stability.
Dundee and Tensas: DtA	Fair	Fair to poor.	Fair	Fair to poor.	Old natural levees; moderate to high shrink-swell potential.	Moderately slow to slow permeability.
Falaya: Fa, Fe. Includes Waverly part of Fe.	Fair to good.	Fair to poor.	Fair; easily eroded.	Fair to poor; high water table.	Flooding; high water table.	Low stability; can be used if moisture is properly controlled.
Forestdale: Fo, Fr	Poor to fair.	Poor	Poor	Poor; high water table.	High water table; moderate to high shrink-swell potential.	Slow seepage; moderate to high shrink-swell potential.

properties of the soils

Soil features affecting—Continued					Limitations for sewage disposal fields
Farm ponds		Agricultural drainage	Irrigation	Waterways	
Reservoir area	Embankment				
Slow seepage	Very slow permeability; cracks when dry.	Needs surface drainage; very slowly permeable; seasonally high water table.	Cracks easily; rapid initial intake decreases as soil becomes moist.	Low, nearly level; clay texture.	Severe because of very slow permeability.
Slow seepage	Unstable but can be used.	Needs surface drainage; areas are low and depressed; subsurface drainage difficult.	Fairly slow intake	Sod sometimes difficult to establish; moderate available water capacity.	Severe because of high water table.
Slow seepage	Low to fair strength and stability.	Needs surface drainage; perched water table.	Slow intake; thin subsoil above fragipan.	Moderate to shallow root zone; difficult to establish sod in fragipan zone.	Severe to very severe because of slow permeability in fragipan.
Slow seepage	Low to fair strength and stability.	Level areas need surface drainage.	Slow intake; high available water capacity.	High available water capacity; grows good sod.	Moderate to slight because of moderate permeability.
Slow seepage	Low strength and stability.	Needs surface drainage; moderately permeable.	Slow intake; high available water capacity.	High available water capacity; grows good sod.	Severe to moderate because of flooding.
Slow seepage	Fair to high strength in upper part; high shrink-swell potential in lower part.	Needs surface drainage; moderately permeable above 30 inches and slowly permeable below 30 inches.	Slow intake	High available water capacity; grows good sod.	Severe because of flooding and plastic clay subsoil.
Excessive seepage	Rapid permeability	Not needed	Rapid intake and rapid permeability.	Droughtiness; sandy texture.	Slight.
Possible seepage	Fair to high strength and stability.	May need some shallow field ditches.	Moderate intake; moderate permeability.	Moderate natural fertility; grows good sod.	Slight because of moderate permeability.
Possible seepage	Fair to high strength and stability.	May need shallow field ditches; moderately slow permeability.	Fair intake; moderately slow permeability.	Moderate natural fertility; grows good sod.	Moderate because of moderately slow permeability.
Moderately slow to slow seepage.	Fair to high strength and stability.	Needs surface drainage; moderately slow to slow permeability.	Moderate to slow intake; moderate available water capacity.	Moderate natural fertility; grows good sod.	Moderate for Dundee and severe for Tensas; moderately slow to slow permeability.
Slow seepage	Low strength and stability; can be used if moisture is properly controlled.	Needs surface drainage; high water table; moderate permeability.	Slow intake; moderate to high available water capacity.	Moderate to high available water capacity; grows good sod.	Severe because of flooding and high water table.
Holds water well	Slow seepage; moderate to high shrink-swell potential.	Needs surface drainage; slow permeability.	Slow intake; high available water capacity.	Moderate natural fertility; grows good sod.	Severe because of high water table.

TABLE 4.—*Interpretation of engineering*

Soil series and map symbols	Suitability as source of—			Suitability for winter grading	Soil features affecting—	
	Topsoil	Road subgrade	Road fill		Highway location	Dikes or levees
Grenada: GrA, GrB2, GrC3	Poor	Fair to poor.	Poor; easily eroded.	Poor; high water table caused by fragipan.	High water table caused by fragipan; erodes easily; nearly level to gently sloping.	Low to fair stability, but can be used.
Gullied land-Memphis complex: GuF.	Poor	Poor	Poor; easily eroded.	Poor; high erodibility.	Variable	Fair stability for Memphis; variable for Gullied land.
Leverett: LeA, LeB	Fair; easily eroded.	Fair to poor.	Fair to poor; unstable and easily eroded.	Fair	Fragipan impedes internal drainage; easily eroded.	Unstable; can be used if moisture is properly controlled.
Loring: LoA, LoB2, LoC2, LoD2.	Poor; easily eroded.	Fair to poor.	Fair to poor; unstable and easily eroded.	Poor; easily eroded.	Fragipan impedes internal drainage; easily eroded.	Unstable; can be used if moisture is properly controlled.
Memphis: MeA, MeB2, MeC2, MeD2, MeD3, MeE, MeE3, MeF, MeF3.	Fair to good.	Fair to poor.	Fair to poor; easily eroded.	Poor; high erodibility.	Slopes easily eroded; soil properties fair.	Fair stability
Memphis-Natchez complex: MnF.	Fair for Memphis; good for Natchez.	Fair to poor.	Fair to poor; easily eroded.	Poor; easily eroded.	Steep slopes; easily eroded.	Low to fair stability
Rosebloom: Ro	Poor	Fair to poor.	Poor	Poor; high water table.	Flooding; high water table.	Unstable; can be used if moisture is properly controlled.
Sharkey: Sh	Poor	Poor	Poor	Poor; clay texture; high water table.	Very plastic clay; high water table; flooding.	High shrink-swell potential.
Tippo: TpA	Poor to fair; unstable.	Fair to poor.	Poor; unstable.	Poor; high water table caused by fragipan.	High water table; seepage.	Low to fair stability and strength; can be used if moisture is controlled.
Tutwiler: TuA	Good	Good	Good	Good; occurs on old natural levees; sandy texture.	Old natural levees; soil properties favorable.	High strength and stability.

properties of the soils—Continued

Soil features affecting—Continued					Limitations for sewage disposal fields
Farm ponds		Agricultural drainage	Irrigation	Waterways	
Reservoir area	Embankment				
Slow seepage	Low to fair stability	Level areas need surface drainage; perched water table.	Slow intake; moderate available water capacity.	Moderate available water capacity except in fragipan; grows good sod.	Severe because fragipan impedes drainage.
Slow seepage for Memphis; variable for Gullied land.	Low to fair strength for Memphis; variable for Gullied land.	Moderate permeability; nonagricultural land.	Slow intake for Memphis; variable for Gullied land.	Memphis grows good sod; variable for Gullied land.	Moderate to slight for Memphis; variable for Gullied land.
Slow seepage	Low to fair stability.	Needs surface drainage in level areas; moderately permeable in upper subsoil and slow in fragipan.	Slow intake; high available water capacity.	High available water capacity; grows good sod.	Moderate because fragipan impedes internal drainage.
Slow seepage	Low to fair stability.	Needs surface drainage in level areas.	Slow intake; high available water capacity.	High available water capacity; grows good sod.	Moderate because fragipan impedes internal drainage.
Slow seepage	Low to fair strength and stability.	Needs surface drainage in level areas only.	Slow intake; high available water capacity.	High available water capacity; grows good sod.	Slight where slope is less than 8 percent; severe where slope is over 8 percent; moderately permeable.
Slow seepage	Low to fair strength and stability.	Not needed	Slow intake; high available water capacity.	High available water capacity; grows good sod.	Severe because of steep slopes.
Slow seepage; flooding.	Unstable	Needs surface drainage; seasonally high water table; flooding.	Slow intake; high available water capacity.	High available water capacity; grows good sod.	Severe because of flooding and high water table.
Slow seepage	Very slow permeability; cracks when dry.	Needs surface drainage; slowly permeable; seasonally high water table.	Cracks easily; rapid initial intake decreases as soil becomes moist.	Low; nearly level; clay texture.	Severe because of very slow permeability.
Slow seepage	Low to fair strength and stability.	Needs surface drainage; seasonally high water table.	Slow intake; thin subsoil above fragipan.	Moderate to shallow root zone; difficult to establish sod in fragipan zone.	Severe to very severe because of fragipan.
Leakage through sandy material.	Good strength	Not needed	Moderately rapid intake and moderately rapid permeability below a depth of about 2 feet.	Moderate natural fertility; grows good sod.	Slight.

TABLE 4.—*Interpretation of engineering*

Soil series and map symbols	Suitability as source of—			Suitability for winter grading	Soil features affecting—	
	Topsoil	Road subgrade	Road fill		Highway location	Dikes or levees
Tutwiler-Bruno complex: TwB.	Good for Tutwiler; fair for Bruno.	Good	Good	Good; occurs on high ridges.	Nearly level to gently sloping areas; soil favorable for Tutwiler; soil fair for Bruno.	Moderately rapid permeability below a depth of about 2 feet for Tutwiler; rapid permeability for Bruno.
Vicksburg: Vc	Good	Fair to poor.	Fair; easily eroded.	Fair to poor; high water table.	Flooding; soil properties fair.	Low to fair stability; low shrink-swell potential.
Vicksburg and Bruno soils: Vk.	Good for Vicksburg; fair for Bruno.	Fair for Vicksburg; good for Bruno.	Fair	Fair; subject to flooding.	Flood plain; subject to flooding; soil properties fair.	Low to fair stability for Vicksburg; rapid permeability for Bruno.
Waverly: Wv	Fair	Fair to poor.	Fair; easily eroded.	Poor; high water table.	Flood plain; subject to flooding.	Poor strength and stability; slow permeability.

Some engineers prefer to use the Unified Soil Classification System, which was developed by the Corps of Engineers, U.S. Army (*10*). This system is based on identification of soils according to their texture and plasticity and their performance as construction materials. Soil materials are identified as coarse grained (8 classes), fine grained (6 classes), or highly organic. The coarse-grained soils are gravels (G) and sands (S), the fine-grained soils are silts (M) and clays (C), and the highly organic soils are peat (Pt) and other organic soils.

Estimates of the classification of each soil in the county according to each of these two systems are given in table 3.

Estimated soil properties

Table 3 gives estimates of soil properties significant in engineering.

The column headed "Depth to seasonal high water table" gives estimates of both the depth to and the duration of a seasonal high water table. The estimates were based on the drainage class of the soils, on field observations, and on the judgment of soil scientists familiar with the soils of the county.

The column headed "Flood hazard" refers to the frequency and duration of flooding caused by overflow, runoff, or seepage. The estimates are based on information obtained in hydrological surveys.

The column headed "Depth from surface" shows the depth and thickness of the layers for which estimates were made. For each layer, the table gives an estimate of the engineering classification and of the USDA textural classification, both based on estimates of the percentage of the soil material that would pass No. 10 and No. 200 sieves. The depth at which bedrock occurs is not given, because in this county bedrock is so far below the surface that it presents no problem in engineering.

Permeability, or the rate at which water moves through the soil, is important in the construction of foundations, because the settlement of a structure depends on the rate at which moisture is squeezed from underneath the structure. For the same reason, permeability is important in the construction of highway and railroad embankments and subgrades. It is also important in determining the effectiveness of open drainage ditches, tile drains, irrigation systems, and disposal fields for sewage systems. Permeability is expressed in terms of inches per hour. The estimates in table 3 were made on the basis of soil structure and porosity, without compaction, and were compared with the results of permeability tests on undisturbed cores of similar material.

The column headed "Available water capacity" gives estimates of the approximate amount of capillary water in a soil that is wet to field capacity, or the difference between the amount of water at field capacity and the amount at the permanent wilting point of plants. When the soil is air dry, this amount of water will wet the soil material to a depth of 1 inch without deeper penetration. The available water capacity is expressed in terms of inches of water per inch of soil depth.

The column headed "Reaction" gives the estimated degree of acidity or alkalinity, expressed in pH values. The pH of a neutral soil is 7.0, that of an acid soil is less than 7.0, and that of an alkaline soil is more than 7.0.

The ratings in the column headed "Dispersion" indicate

properties of the soils—Continued

Soil features affecting—Continued					Limitations for sewage disposal fields
Farm ponds		Agricultural drainage	Irrigation	Waterways	
Reservoir area	Embankment				
Leakage through sandy material.	Good strength for Tutwiler; chance of seepage for Bruno.	Not needed if flooding is controlled.	Moderately rapid to rapid intake.	Tutwiler grows good sod; Bruno is droughty.	Slight if flooding is controlled.
Slow seepage	Low strength and stability.	Needs surface drainage; moderately permeable.	Slow intake; high available water capacity.	High available water capacity; grows good sod.	Severe to moderate because of flooding.
Slow seepage for Vicksburg; rapid seepage for Bruno.	Low stability for Vicksburg; chance of seepage for Bruno.	Needs surface drainage and flood control.	Slow intake for Vicksburg; rapid intake for Bruno.	Vicksburg grows good sod; Bruno is droughty.	Severe to moderate because of flooding.
Slow seepage	Low strength and stability.	Needs surface drainage and flood control; seasonally high water table.	Slow intake; high available water capacity.	High available water capacity; grows fairly good sod.	Severe because of seasonal high water table and flooding.

the degree to which and the rate at which a soil slakes and its structure breaks down in water. A rating of high means that the soil slakes readily.

The ratings in the column headed "Shrink-swell potential" show how much a soil changes in volume as its moisture content changes. The estimates are based mainly on the amount and type of clay in the soil.

Engineering interpretations

In table 4 engineering interpretations of the properties of the soils are given, and some features that affect specific engineering works are listed.

Topsoil, as used in table 4, refers to material suitable for surfacing road shoulders, cut slopes, and other areas where vegetation is needed for erosion control. Tutwiler very fine sandy loam is a good source of topsoil.

As sources of material for road subgrade and road fill, the sandy soils of the Bruno, Crevasse, and Tutwiler series are generally the best in the county. Dundee and Dubbs soils are fair sources of such materials. Alligator, Sharkey, and other clayey soils that shrink and swell are poor. The danger of cracking and warping of pavement resulting from expansion and contraction of such soils can be minimized by using a thick base course of soil material that has a low shrink-swell potential.

Suitability for winter grading depends largely on texture and the depth to the water table. Dubbs, Tutwiler, and Bruno soils are rated good; they are medium-textured to coarse-textured soils on ridges and natural levees. Waverly, Tippo, Rosebloom, Falaya, and Collins soils are rated poor because they have a high water table in winter.

Ponding, flooding, and a seasonal high water table have to be considered in picking locations for highways. On soils that are ponded and on those that have a high water table, roads either must be constructed on high embankment sections or must be provided with surface drains and underdrains. On soils that are flooded, such as those of the Waverly, Falaya, Collins, Rosebloom, and Calhoun series, roads must be constructed on continuous embankments several feet above the usual flood level. Also to be considered in locating and designing highways is a fragipan, such as occurs in Loring, Grenada, Calloway, and Tippo soils. A fragipan impedes drainage, and water that collects above the pan forms a perched water table.

Dikes and levees are built to protect areas from stream overflow and from excessive runoff. They are subjected to alternate wetting and drying. Stability and strength are significant soil features. Sharkey and Alligator soils, which crack when dry, are likely to be unstable. Dubbs and Tutwiler soils have high strength and stability.

Farm ponds supply water for livestock and offer opportunities for recreation. Soils that have moderate to slow permeability and, consequently, a slow rate of seepage, can be used for the reservoir area. Strength and stability are the features significant in constructing embankments.

Most of the nearly level soils of the county need an agricultural drainage system that will move excess surface water into large ditches, canals, and creeks. The gently sloping to very steep soils of the Crevasse, Bruno, Tutwiler, Memphis, and Natchez series do not need drainage.

Suitability for irrigation depends on the rate of water intake and the available water capacity. Cascilla, Collins,

Falaya, Forestdale, Leverett, Loring, Memphis, Rosebloom, Vicksburg, and Waverly soils have a slow intake rate and a high available water capacity. Crevasse and Bruno soils have a rapid intake rate but a low available water capacity.

To be suitable for waterways, a soil must be capable of supporting a good cover of sod. Available water capacity, fertility, depth, and texture are among the significant features. Memphis, Loring, Cascilla, Leverett, Collins, Falaya, Vicksburg, Rosebloom, and Waverly soils have favorable features and produce good sod. Crevasse and Bruno soils are coarse textured and droughty.

Sewage disposal fields do not function properly if the soils have a fragipan, if they have a seasonal high water table, if they are subject to flooding, or if they have slopes of more than 8 percent. Crevasse, Bruno, Tutwiler, and Dubbs soils and Memphis soils of less than 8 percent slopes have only slight limitations.

Use of the Soils for Wildlife and Fish [4]

All animals are dependent either directly or indirectly on plants, and all of the soils in Tallahatchie County produce plant associations that are suitable for some kind of wildlife. The habitat requirements of the principal kinds of wildlife and the capacity of the soils to meet these requirements are described in this section.

Wildlife trends

As the pattern of land use changes, the wildlife population changes. Deer, turkeys, squirrels, and other forest game were abundant in the early days, when the county was practically all in timber. As land was cleared for farming, the forest game was replaced by bobwhites, doves, rabbits, and songbirds, all of which need a semiopen habitat. More recently, reforestation and good management of the remaining woodland have brought forest game back to the eastern part of the county. In the western part, known locally as the Delta, farming has eliminated much of the forest game habitat and drainage has reduced the areas suitable for waterfowl and fish habitat. To maintain a wildlife population, it is now generally necessary to provide food and cover plants and to manage the natural vegetation, as part of the land-use program.

Habitat requirements

Some kinds of wildlife need a woodland habitat, some a marshland habitat, and some open farmland. Most require some elements of each of these. The ability of an area to support a given kind of wildlife depends on the capacity of the soils to produce the necessary plant life. The ability to support fish depends on the quality and quantity of water and the nature of the surrounding soils and the plant life.

GAME SPECIES.—Bobwhites, doves, and rabbits are attracted to areas of open farmland, and particularly to cropland. Squirrels, deer, and other forest game thrive in woodland that is composed at least partly of hardwoods. The larger streams and beaver ponds along the smaller streams provide the kind of habitat needed by ducks.

Bobwhite quail.—These birds need open and semiopen areas. Their food supplies should be near vegetation that offers shelter from adverse weather and protection against predators. Choice foods for bobwhites are acorns, beechnuts, blackberries, browntop millet, Texas millet, black cherries, corn, cowpeas, flowering dogwood, lespedeza (bicolor, Kobe, Korean, and common), mulberries, pine seed, partridgepeas, ragweed, sweetgum seed, and tickclover. Bobwhites also eat insects in the warm seasons.

Deer.—Deer need woodland areas of 500 acres or more and a dependable source of water. Some of their choice foods are acorns, clover, corn, cowpeas, greenbrier, honeysuckle, oats, fescue, and wheat. Many other native forage plants are also eaten.

Doves.—These birds thrive in large, open fields without thick ground cover. They need water daily. Choice foods are browntop millet, corn, croton seed, grain sorghum, panicgrass, pine seed, pokeberry, ragweed, sweetgum seed, and wheat.

Ducks.—Areas of natural water or areas that flood in winter are necessary for ducks. Some choice foods are acorns, beechnuts, corn, browntop millet, Japanese millet, and smartweed.

Rabbits.—Adequate cover is the primary need for rabbits. Good cover plants are blackberry briers, multiflora rose, sericea lespedeza, low-growing brush, shrubs, or annual weeds. Their foods are primarily grass, clover, waste grain, and bark.

Squirrels.—Woodland that includes hardwoods and covers at least a few acres is an absolute requirement. Choice foods are acorns, beechnuts, blackgum, black cherry, corn, dogwood, hickory nuts, mulberries, and seeds of maple, pecan, and pine trees.

NONGAME BIRDS.—The food and other habitat requirements of these birds vary according to the species. Some eat nothing but insects, a few combine insects and fruits, and several other species combine insects with acorns, nuts, and fruits.

FISH.—The principal game fish in the ponds and streams are bass, bluegills and other kinds of sunfish, and channel catfish. The poundage of usable fish produced in a pond depends on the fertility of the watershed and of the pond bottom. Most ponds need fertilizer and lime. Bluegills and most of the other sunfish eat aquatic worms, insects, and insect larvae. Bass and catfish eat small fish, frogs, crayfish, and other aquatic forms of animal life.

Wildlife areas

The soils of Tallahatchie County have been grouped, by soil associations, into three kinds of wildlife habitat. The associations are described under the heading "General Soil Map." The extent of each kind of habitat can be determined by referring to the general soil map at the back of this survey.

WILDLIFE AREA 1

This area consists of the Alligator-Forestdale association, the Alligator association, and the Dundee-Dubbs association. Poorly drained, fine-textured to medium-textured, level to gently undulating soils of the Mississippi

[4] EDWARD G. SULLIVAN, biologist, Soil Conservation Service, prepared this section.

River delta make up these associations. There are some meandering depressions and some natural lakes and sloughs. The total extent is about 59 percent of the county.

Much of the acreage is farmed intensively. Cotton, soybeans, and grain are the principal crops.

The woodlands include many kinds of hardwoods and thus provide excellent habitat for deer and squirrels.

Cottontail rabbits are abundant; the thick cover of grass and weeds around fields and pastures provides suitable living conditions for them.

Various plant associations in this area offer food and cover for swamp rabbits, other furbearers, and many kinds of songbirds.

Bobwhite quail are not numerous; the pattern of land use does not create conditions favorable for them, and the native plants that provide their food are subject to severe competition from johnsongrass, weeds, and brush.

Doves are attracted in large numbers to the large open fields of grain and native grass.

Woodlands that contain many hardwoods and that can be flooded in winter provide suitable habitat for ducks, and so do fields planted to browntop millet or Japanese millet and then flooded. Browntop millet is suited to fairly well drained soils, and Japanese millet to wet soils. Plenty of water for flooding duck-feeding areas can be obtained from lakes, bayous, and wells.

Manmade fishponds of the dugout type provide good fishing under proper management. They are particularly well suited to commercial catfish farming. Overflow, which brings in wild fish, is a hazard. Plenty of well water is available for filling ponds.

WILDLIFE AREA II

This area consists of the Collins-Falaya association, the Falaya-Collins association, and the Waverly-Calhoun association. These associations are made up of medium-textured, somewhat poorly drained to moderately well drained, level to nearly level soils, mainly on the flood plains of creeks in the eastern part of the county. A strip between the bluff hills and the delta is included. The total extent is about 18 percent of the county.

Most of the acreage is farmed intensively. About half of the Waverly-Calhoun association is in hardwood timber.

The woodland, though of limited extent, provides excellent food and cover for deer and squirrels.

Food and cover plants needed for bobwhite quail are well suited to the soils of this area. Native food plants, among them lespedeza, partridgepea, and beggartick, are abundant. Millet, cowpeas, and lespedeza are food plants suitable for planting. Cover plants are plentiful if allowed to grow.

Blackberry bushes, brush, annual weeds, and other plants that provide cover for rabbits are abundant if allowed to grow. Native and planted grasses and forbs on which rabbits feed are well suited.

Corn and grain sorghum and the native grass around the crop fields provide choice food for doves. Browntop millet and Texas millet are other food plants that could be grown on these soils.

There are a few areas of hardwoods that could be flooded in winter to provide habitat for ducks. Open fields enclosed by levees can be planted to browntop millet and corn and then flooded. Japanese millet can be grown for duck food along the margins of lakes and beaver ponds.

Dugout ponds can be built, but the topography is not generally suitable for ponds. Overflow, which brings in wild fish, is a hazard near the streams.

WILDLIFE AREA III

This area consists of the Memphis-Gullied land association, a tract of moderately sloping to very steep uplands dissected by intermittent streams and drainageways that have narrow bottom lands. Much of the acreage is severely gullied. This area is in the eastern part of the county. The total extent is about 23 percent of the county.

The ridges and bottom lands in this area are used as cropland and pasture, and the steeper parts are wooded.

Annual lespedeza, which is a choice quail food, grows abundantly around the edges of fields and pastures and in idle areas. Several other native food plants grow equally well. Any of the plants suitable for quail food plantings can be grown.

The plants that provide food and cover for cottontail rabbits are abundant on the small farms that are common throughout this area.

Doves are to be found only in open fields where they can feed on waste grain, native grass seed, and woolly croton seed. Millet, another suitable source of food for doves, could be grown.

Much of the woodland in this area has been cut over or is in young stands of planted pine. As yet the habitat for forest game is only fair, but the potential for the future is good. Woodland that produces acorns attracts quail.

Sites suitable for duck fields are scarce. A few of the larger ponds, reservoirs, and beaver ponds could be developed into duck-feeding areas by manipulating the water level and planting Japanese millet.

Sites suitable for ponds are common, and many ponds have been built (fig. 5). Good production of fish is possible through good management. Since most of the soils are acid, it is advisable to lime the bottom before filling a pond.

Use of the Soils for Recreation

Tallahatchie County provides opportunities for fishing, hunting, golfing, and picnicking. The Tallahatchie River and numerous bayous, lakes, and farm ponds are open to fishermen. Some lakes in the uplands, formed by floodwater-retarding structures, are suitable for boating, fishing, swimming, and water skiing. Many areas around the lakes are suitable for picnic grounds and camping grounds, and some have already been developed. Some areas are used for breeding deer and other game.

Table 5 shows the relative degrees of limitation of the soils, from very slight to very severe, for specified recreational uses and also as sites for dwellings. "Slight" and "very slight" indicate that there is no significant limitation. "Moderate" means that the limitation is significant but can be overcome by planning and engineering requiring moderate investment. "Severe" means that the limitation is such that it can be overcome only by intensive

Figure 5.—Farm pond in an area of Collins soil within the Memphis-Gullied land association.

planning and engineering requiring a considerable investment. "Very severe" indicates that use of the soil for the specified purpose is not advisable.

Explanations of the headings in table 5 and of the criteria used to evaluate the limitations of the soils for each use follow.

Dwellings with public or community sewage systems.—This refers to dwellings of three stories or less. The properties most important in evaluating limitations for this use are bearing capacity, shrink-swell behavior, depth to water table, flood hazard, slope, and depth to hard rock. Soils on which such dwellings are to be built must be capable of supporting the building and ought not to be subject to flooding. The water table should be at a depth of 30 inches or more most of the year and never at a depth of less than 15 inches.

Campsites.—A campsite is an area used for tent living and the accompanying outdoor activities for a period of a week or longer. Only a little site preparation ought to be necessary. The properties most important in evaluating limitations for campsites are slope, trafficability, and inherent erodibility. Soils to be used for campsites must be well drained and should be fertile enough to support trees and grass. An attractive landscape is desirable.

Picnic areas.—These are areas used for pleasure outings at which a meal is eaten outdoors. Picnic tables and a fireplace are usually furnished, but otherwise very little site preparation ought to be needed. The properties most important in evaluating limitations for this use are accessibility, trafficability, slope, and inherent erodibility. An attractive landscape is desirable.

Intensive play areas.—These are areas developed for use as playgrounds and for organized games such as baseball, tennis, and badminton. Such areas are subject to heavy foot traffic. Two acres or less is generally an adequate size. The properties most important in evaluating limitations for this use are slope, drainage, and trafficability. Coarse fragments and outcrops are unfavorable features.

Golf fairways.—The properties most important in evaluating the limitations of soils for use as fairways are trafficability, fertility, slope, and content of coarse fragments and outcrops. Almost any kind of soil can be utilized for the rough, and greens are usually man made;

TABLE 5.—*Limitations of soils for recreational uses*

[Absence of rating means information not available]

Soil	Dwellings with public or community sewage systems	Campsites	Picnic areas	Intensive play areas	Golf fairways	Trafficways
Alligator: AcA, Ad, AsA.	Severe: high water table; high shrink-swell potential.	Severe: poor trafficability.	Severe: poor trafficability.	Severe: poor trafficability.	Severe: poor trafficability.	Severe: high water table; poor traffic-supporting capacity.
Calhoun: Ca, Cb—Includes Bonn part of Cb.	Severe: seasonal high water table; flood hazard.	Severe: poor trafficability.	Severe: poor trafficability.	Severe: poor trafficability.	Severe: poor trafficability; low to medium productivity.	Severe: seasonal high water table; flood hazard; poor traffic-supporting capacity.
Calloway: ClA	Moderate: seasonal high water table.	Moderate: fair trafficability.	Moderate: fair trafficability.	Severe: fair trafficability.	Moderate: fair trafficability.	Moderate: fair traffic-supporting capacity.
Cascilla: CmA	Very slight	Slight	Slight	Slight	Slight	Slight.
Collins:						
Cn	Moderate to severe: high water table; flood hazard.	Moderate: fair trafficability.	Moderate: fair trafficability.	Moderate: fair trafficability.	Moderate: fair trafficability.	Moderate to severe: fair to poor traffic-supporting capacity; flood hazard.
Co	Severe: flood hazard; seasonal high water table.	Moderate: fair trafficability.	Moderate: fair trafficability.	Moderate: fair trafficability.	Moderate: fair trafficability.	Severe: flood hazard; poor traffic-supporting capacity.
Crevasse and Bruno: Cs.	Slight	Moderate: fair trafficability.	Moderate: fair trafficability.	Moderate: fair trafficability.	Moderate: fair trafficability; medium productivity.	Slight.
Dubbs: DbA, DbB.	Slight	Slight to moderate: fair trafficability.	Slight to moderate: fair trafficability.	Slight to moderate: fair trafficability.	Slight to moderate: fair trafficability.	Slight to moderate: fair traffic-supporting capacity.
Dundee:						
DdA, DdB, DeA, DeB.	Moderate: moderately slow permeability.	Moderate: fair trafficability.	Moderate: fair trafficability.	Moderate: fair trafficability.	Moderate: fair trafficability.	Moderate: fair traffic-supporting capacity.
DnC	Moderate: moderately slow permeability.	Moderate: fair trafficability; 5 percent slope.	Moderate: fair trafficability.	Moderate: 5 percent slope.	Moderate: 5 percent slope.	Moderate: fair traffic-supporting capacity.
Dundee and Tensas: DtA.	Moderate to severe: low to high shrink-swell potential; moderately slow to slow permeability.	Moderate to severe: fair to poor trafficability.	Moderate to severe: fair to poor trafficability.	Moderate to severe: fair to poor trafficability.	Moderate to severe: fair to poor trafficability.	Moderate to severe: fair to poor traffic-supporting capacity.
Falaya: Fa, Fe—Includes Waverly part of Fe.	Severe to very severe: flood hazard; seasonal high water table.	Severe: poor trafficability.	Severe: poor trafficability.	Severe to very severe: poor trafficability.	Severe: poor trafficability.	Severe: seasonal high water table; flood hazard; poor traffic-supporting capacity.

TABLE 5.—*Limitations of soils for recreational uses*—Continued

Soil	Dwellings with public or community sewage systems	Campsites	Picnic areas	Intensive play areas	Golf fairways	Trafficways
Forestdale: Fo, Fr	Severe: high shrink-swell potential; seasonal high water table.	Severe: poor trafficability.	Severe: poor trafficability.	Severe: poor trafficability.	Severe: poor trafficability.	Severe: seasonal high water table; poor traffic-supporting capacity.
Grenada:						
GrA, GrB2	Moderate: fragipan.	Slight	Slight	Moderate: fair trafficability.	Slight	Slight.
GrC3	Moderate: low productivity; slow permeability in subsoil.	Severe: slope; poor trafficability.	Moderate: poor trafficability.	Severe: poor trafficability; slope.	Severe: slope; low productivity; poor trafficability.	Moderate: erosion.
Gullied land-Memphis complex: GuF.						
Leverett: LeA, LeB.	Slight	Slight	Slight	Slight	Slight	Slight.
Loring:						
LoA, LoB2	Slight	Slight	Slight	Slight	Slight	Slight.
LoC2	Slight	Slight to moderate.	Slight	Moderate: slope.	Moderate: slope.	Slight.
LoD2	Moderate: slope; slow permeability in subsoil.	Moderate: slope.	Moderate: slope.	Moderate: slope.	Moderate: slope	Moderate: erosion.
Memphis:						
MeA, MeB2	Very slight	Slight	Slight	Slight	Slight	Slight.
MeC2	Very slight	Slight	Slight	Moderate: slope.	Moderate: slope.	Slight.
MeD2	Slight	Moderate: slope.	Slight	Moderate: slope.	Moderate: slope.	Slight.
MeD3	Moderate: low productivity; slope.	Moderate to severe: slope; fair trafficability.	Moderate: fair trafficability.	Severe: slope; fair trafficability.	Severe: slope; fair trafficability.	Slight.
MeE	Moderate: slope	Severe: slope	Moderate: slope	Severe: slope	Severe: slope	Moderate: slope.
MeE3	Severe: slope; low productivity.	Severe: slope; poor trafficability.	Severe: slope; poor trafficability.	Very severe: slope; poor trafficability.	Severe: slope; poor trafficability.	Moderate: slope; erosion.
MeF	Severe: slope	Severe: slope	Severe: slope	Very severe: slope.	Severe: slope	Severe: slope.
MeF3	Severe: slope	Severe: slope	Severe: slope	Very severe: slope.	Severe: slope	Severe: slope.
Memphis-Natchez complex: MnF.	Severe: slope	Severe: slope	Severe: slope	Very severe: slope.	Severe: slope	Severe: slope.
Rosebloom: Ro	Very severe: flood hazard; high water table.	Very severe: poor trafficability.	Severe: poor trafficability.	Very severe: poor trafficability.	Severe: poor trafficability.	Severe: flood hazard; high water table; poor traffic-supporting capacity.

TABLE 5.—*Limitations of soils for recreational uses*—Continued

Soil	Dwellings with public or community sewage systems	Campsites	Picnic areas	Intensive play areas	Golf fairways	Trafficways
Sharkey: Sh	Severe: high water table; high shrink-swell potential.	Severe: poor trafficability.	Severe: poor trafficability.	Severe: poor trafficability.	Severe: poor trafficability.	Severe: high water table; poor traffic-supporting capacity.
Tippo: TpA	Moderate: seasonal high water table.	Moderate: fair trafficability.	Moderate: fair trafficability.	Severe: fair trafficability.	Moderate: fair trafficability.	Moderate: fair traffic-supporting capacity.
Tutwiler: TuA, TwB. Includes Bruno part of TwB.	Slight	Slight	Slight	Slight	Slight	Slight.
Vicksburg: Vc, Vk. Includes Bruno part of Vk.	Moderate: flood hazard.	Moderate: fair trafficability.	Moderate: fair trafficability.	Moderate: fair trafficability.	Moderate: fair trafficability.	Moderate: fair trafficability.
Waverly: Wv	Very severe: flood hazard; seasonal high water table.	Severe: poor trafficability.	Severe: poor trafficability.	Very severe: poor trafficability.	Severe: poor trafficability.	Severe: flood hazard; high water table; poor traffic-supporting capacity.

consequently, no evaluations of limitations for these uses have been made.

Trafficways.—Trafficways are areas that can be developed into access roads and trails through limited cut and fill and limited preparation of subgrade. The properties most important in evaluating limitations for trafficways are slope, depth to water table, flood hazard, erodibility, and traffic-supporting capacity.

Formation and Classification of the Soils

This section has three main parts. The first describes the five major factors of soil formation; the second, the processes involved in soil horizon differentiation; and the third, the system of classifying soils and the placement of the soils of Tallahatchie County in the nationwide classification system.

Factors of Soil Formation

Soil is the product of the interaction of the five major factors of soil formation: climate, living organisms (especially vegetation), parent material, relief, and time.

Climate

The climate of Tallahatchie County is of the humid, warm-temperate, continental type. Winters are mild and generally have short periods of freezing weather. Summers are fairly hot, and occasionally the temperature is more than 100° F. These features of climate favor rapid chemical reactions. Heavy rainfall late in winter and early in spring leaches soluble material from the soils and limits the accumulation of organic matter. Climate is fairly uniform throughout the county and therefore is not a major cause of differences among the soils.

Living organisms

Plants, animals, insects, bacteria, and fungi are important in the formation of soils. Gains in organic matter and nitrogen, gains or losses in plant nutrients, and alterations in structure and porosity are some of the changes caused by living organisms.

Vegetation, mainly hardwood and pine trees, has affected soil formation in Tallahatchie County more than other living organisms. The native vegetation on the hills in the county consisted chiefly of hickory, red maple, red oak, white oak, and shortleaf pine. On the delta and on the well-drained bottom lands in the hills were ash, basswood, linden, beech, and other lowland hardwoods. On the poorly drained bottom lands were cypress, cottonwood, and sweetgum. Cypress, willow, sycamore, and water oak grew on the clay soils in the delta. The soils that formed under these mixtures of trees are generally low in organic matter.

Parent material

Parent material is the unconsolidated mass from which a soil develops. It determines the limits of the chemical and mineralogical composition of the soil. The parent

material of the soils in Tallahatchie County consists of Mississippi River alluvium and loess.

The soils of the delta, in the western and central parts of the county, formed in Mississippi River alluvium. Bordering the past and present channels of the Mississippi River are low ridges called natural levees. These levees are highest next to the channels and slope gradually away from them. The levees consist of the coarser textured sediments dropped from floodwaters. Tutwiler, Dubbs, and Dundee soils formed in these sediments. These soils are somewhat poorly drained to well drained.

In the low flat areas beyond the natural levees, clay sediments dropped from slowly moving or still water. Alligator and Sharkey soils formed from this type of material. They are very slowly permeable and poorly drained.

Along drainageways throughout the uplands, adjacent to the bluff hills, and along streams coming out of the loess hills are soils that formed in alluvium deposited by smaller streams. Some of these soils are still receiving new deposits of soil material and have weakly developed profiles. Examples are the Crevasse, Collins, and Falaya soils. Some that are on older flood plains have distinct horizons. Examples are the Leverett, Tippo, and Calhoun soils.

The Memphis, Loring, Grenada, and Calloway soils formed in loess on uplands. These soils have distinct horizons.

Relief

Relief affects soil formation through its influence on drainage, erosion, plant cover, and soil temperature.

The slope range in Tallahatchie County is 0 to 40 percent. The western and central parts of the county are nearly level to gently sloping and are characterized by low parallel ridges 200 to 400 feet wide and depressions that seldom exceed 150 feet in width. The eastern part of the county is characterized by narrow ridgetops, strongly sloping to very steep side slopes, narrow drainageways, and a broad, nearly level flood plain.

Time

The differences in length of time that parent materials have been in place are commonly reflected in the degree of development of the soil profile.

The Collins soils, which are on flood plains, are examples of young soils that lack distinct horizons. The Dundee soils are examples of older alluvial soils that have distinct horizons. These soils formed in Mississippi River alluvium and have an acid silty clay loam subsoil that bears little resemblance to the parent material. The Memphis soils, which are on uplands, are examples of older soils that have distinct horizons.

Processes of Soil Horizon Differentiation

Several processes were involved in the formation of soil horizons in the soils of Tallahatchie County: accumulation of organic matter, leaching of calcium carbonates and bases, reduction and transfer of iron, and formation and translocation of silicate clay minerals. In most soils, more than one of these processes has been active in the development of horizons.

In many fields in Tallahatchie County, the accumulation of organic matter in the upper part of the profile has been important because it results in the formation of a thin A1 horizon. In cultivated fields, however, the A1 horizon and the rest of the A horizon have been mixed by plowing, and the resulting layer is called an Ap horizon. Below the A1 horizon the content of organic matter is low.

Leaching of carbonates and bases has occurred in nearly all of the soils. Soil scientists are generally agreed that leaching of bases in soils usually precedes translocation of silicate clay minerals. Most of the soils of the county are moderately to strongly leached.

Reduction and transfer of iron, a process called gleying, is evident in the poorly drained and very poorly drained soils of the county. A gray subsoil indicates the reduction and loss of iron. Reddish-brown mottles and concretions indicate a segregation of iron.

In some soils of Tallahatchie County, the translocation of clay minerals has contributed to horizon development. The eluviated A2 horizon has a platy structure, is lower in content of clay, and is usually lighter in color than the B horizon. The B horizon usually has an accumulation of clay (clay films) in pores and on ped surfaces. These soils were probably leached of carbonates and soluble salts to a considerable extent before translocation of silicate clays took place. Leaching of bases and translocation of silicate clays are among the more important processes in horizon differentiation in the soils of Tallahatchie County. Dundee silt loam is an example of a soil that has translocated silicate clays in the B horizon in the form of clay films.

Classification of the Soils

Soils are classified so that we may more easily remember their significant characteristics, assemble knowledge about them, see their relationships to one another and to the environment, and develop principles that help us understand their behavior and their response to manipulation. First through classification, and then through the use of soil maps, we can apply our knowledge of soils to specific tracts of land.

In the current system, classes are defined in terms of observable or measurable properties of soils. The properties that are considered have been so selected that the result is the grouping of soils of similar genesis. The system has six categories. Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series.[5] Table 6 shows the classification of the soils of Tallahatchie County according to these categories (*9*). It also shows the classification according to one category—the great soil group—of the 1938 system.

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

Order.—The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. The three soil orders that are recognized in

[5] The system of soil classification discussed in this section is that adopted as standard for all soil surveys in the United States, effective January 1, 1965. It replaces the classification of Baldwin, Kellogg, and Thorp (*2*) as revised by Thorp and Smith (*7*).

TABLE 6.—*Soil series classified according to the current classification system and the revised 1938 system*

Series	Current classification system			Great soil group, 1938 classification
	Family	Subgroup	Order	
Alligator	Fine-montmorillonitic, acid, thermic.	Vertic Haplaquepts	Inceptisols	Low-Humic Gley soils.
Bonn	Fine-silty, mixed, thermic	Glossic Natraqualfs	Alfisols	Solodized Solonetz soils.
Bruno	Sandy-siliceous, nonacid, thermic.	Typic Udifluvents	Entisols	Regosols.
Calhoun	Fine-silty, mixed, thermic	Typic Glossaqualfs	Alfisols	Planosols.
Calloway	Fine-silty, mixed, thermic	Aqueptic Fragiudalfs	Alfisols	Planosols.
Cascilla	Fine-silty, mixed, thermic	Fluventic Dystrochrepts	Inceptisols	Gray-brown Podzolic soils.
Collins	Coarse-silty, mixed, acid, thermic.	Aquic Udifluvents	Entisols	Alluvial soils.
Crevasse	Mixed, nonacid, thermic	Typic Udipsamments	Entisols	Regosols.
Dubbs	Fine-silty, mixed, thermic	Typic Hapludalfs	Alfisols	Gray-Brown Podzolic soils.
Dundee	Fine-silty, mixed, thermic	Aeric Ochraqualfs	Alfisols	Gray-Brown Podzolic soils.
Falaya	Coarse-silty, mixed, acid, thermic.	Aeric Haplaquepts	Inceptisols	Alluvial soils.
Forestdale	Fine, mixed, thermic	Typic Ochraqualfs	Alfisols	Low-Humic Gley soils.
Grenada	Fine-silty, mixed, thermic	Ochreptic Fragiudalfs	Alfisols	Gray-Brown Podzolic soils.
Leverett	Coarse-silty, mixed, thermic	Typic Fragiudalfs	Alfisols	Gray-Brown Podzolic soils.
Loring	Fine-silty, mixed, thermic	Typic Fragiudalfs	Alfisols	Gray-Brown Podzolic soils.
Memphis	Fine-silty, mixed, thermic	Typic Hapludalfs	Alfisols	Gray-Brown Podzolic soils.
Natchez	Fine-silty, mixed, thermic	Typic Eutrochrepts	Inceptisols	Gray-Brown Podzolic soils.
Rosebloom	Fine-silty, mixed, acid, thermic.	Typic Haplaquepts	Inceptisols	Low-Humic Gley soils.
Sharkey	Fine-montmorillonitic, nonacid, thermic.	Vertic Haplaquepts	Inceptisols	Grumusols.
Tensas	Fine-montmorillonitic, thermic	Aeric Ochraqualfs	Alfisols	Gray-Brown Podzolic soils.
Tippo	Coarse-silty, mixed, thermic	Aquic Fragiudalfs	Alfisols	Planosols.
Tutwiler	Coarse-silty, mixed, thermic	Typic Hapludalfs	Alfisols	Gray-Brown Podzolic soils.
Vicksburg	Coarse-silty, mixed, acid, thermic.	Typic Udifluvents	Entisols	Alluvial soils.
Waverly	Coarse-silty, siliceous, acid, thermic.	Typic Haplaquepts	Inceptisols	Alluvial soils.

Tallahatchie County are Entisols, Inceptisols, and Alfisols. Entisols are recent soils. They are without genetic horizons or have only the beginnings of such horizons. Inceptisols most commonly occur on young but not recent land surfaces. Alfisols are soils that have a clay-enriched B horizon that is high in base saturation.

Suborder.—Each order is divided into suborders, primarily on the basis of those soil characteristics that seem to produce classes having the greatest genetic similarity. The climatic range is narrower than that permitted in the order. The soil properties considered are mainly those that reflect either the presence or absence of waterlogging, or soil differences resulting from the climate or vegetation.

Great group.—Each suborder is divided into great groups on the basis of uniformity in the nature of the major soil horizons and their sequence in the profiles. The horizons considered are those in which clay, iron, or humus has accumulated or those that have pans that interfere with the growth of roots or the movement of water. The soil features considered are the self-mulching properties of clays, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), and the like.

Subgroup.—Each great group is divided into subgroups, one representing the central (typic) segment of the great group and others, called intergrades, that have properties of one great group and also one or more properties of another great group, suborder, or order.

Family.—Families are established within a subgroup primarily on the basis of properties that affect the growth of plants or the behavior of soils in engineering uses. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence.

Series.—The series is a group of soils having major horizons that, except for texture of surface layer, are similar in important characteristics and in arrangement in the profile.

General Nature of the County

Tallahatchie County was organized December 23, 1833, from territory acquired by the United States from the Choctaw tribe of Indians in 1830. Tallahatchie is an Indian word meaning "River of the Rock" (*4*). In 1870 a part of the original county was transferred to the new county of Grenada and a part to Quitman County.

In 1960, the population of the county was 24,081. Charleston and Sumner are the county seats.

The county is mainly agricultural, but it is also the location of two small factories that manufacture cotton clothing. State and U.S. highways and railroad freight lines cross the county.

Tallahatchie County is in the Yazoo River basin and is drained principally by the Tallahatchie River and its tributaries. The Tallahatchie River flows north to south through the central part of the county. Its main tributaries are the north and south forks of Tillatoba Creek; Ascalmore Creek; Panola-Quitman Floodway; and Cassidy, Opossum, Black, and Tippo Bayous. Hospon Bayou, the Quiver River, and Parks Bayou drain the extreme western side of the county.

Climate

The climate of Tallahatchie County is governed by the subtropical latitude, the large land masses to the north and the warm water of the Gulf of Mexico to the south, and the prevailing southerly winds. The weather in summer is predominantly warm and moist, but occasionally the wind shifts to the west or north and the weather becomes hot and dry. Warm, moist weather alternates with cold, dry weather in winter. Cold spells seldom last more than 3 or 4 days. Precipitation generally accompanies the changes in weather.

Table 7 gives temperature and precipitation data for the county. Table 8 gives the probability of the occurrence of specified temperatures after specified dates in spring and before specified dates in fall.

Winter and spring are the wettest seasons, and summer and fall are the driest, but the differences are small. October is the driest and generally the most pleasant month, and March is the wettest. Winter and spring precipitation is commonly in the form of prolonged rain. Summer and fall precipitation is generally in the form of scattered thundershowers. Local droughts result if the thundershowers bypass specific areas time after time. On the other hand, 3 inches or more of precipitation may occur in a 24-hour period in any month and cause local flash floods. Snow is unusual. A measurable amount falls at least once in 1 out of 3 years, but because freezing temperatures are of short duration, snow seldom remains on the ground more than 2 or 3 days.

Temperatures of 32° F. or below occur on about 70 days each year, and temperatures of 90° or above occur on about 108 days each year. Temperatures of 90° or above occur about 12 percent of the time from May through October, and temperatures of 80° or above about 32 percent of the time in these months. In the period November through April, the temperature is 70° or above about 9 percent of the time and 50° or above about 44 percent of the time. Temperatures of 20° or below occur several times each winter, and temperatures of zero or below occur in 1 year out of 5. Temperatures of 100° or above occur in 3 years out of 4. The ground freezes occasionally, but the freezing is shallow and of short duration. The length of the growing season is about 211 days.

TABLE 7.—*Temperature and precipitation data*

[All data from Charleston station, elevation 214 feet. Periods of record, 1911–22 and 1951–65]

Month	Temperature				Precipitation				
	Mean daily maximum	Mean daily minimum	Two years in 10 will have at least 4 days with—		Mean total	One year in 10 will have—		Days with snow cover of 1 inch or more	
			Maximum equal to or higher than—	Minimum equal to or lower than—		Less than—	More than—	Mean number	Mean depth
	°F.	°F.	°F.	°F.	*Inches*	*Inches*	*Inches*		*Inches*
January	54	32	74	15	5.6	2.5	10.1	[1]	4
February	59	35	77	20	5.1	1.9	10.0	[1]	5
March	66	41	81	27	6.3	2.9	10.2		
April	76	50	87	36	5.7	2.2	10.0		
May	85	59	96	44	3.8	.7	8.1		
June	91	66	100	53	3.9	.4	6.9		
July	94	69	100	62	4.2	1.0	8.3		
August	94	68	101	57	2.9	.5	4.9		
September	89	61	99	46	3.3	.6	8.1		
October	78	49	90	36	2.5	.6	6.4		
November	66	39	81	20	4.4	1.2	11.7		
December	57	32	72	19	5.2	1.7	9.5	[1]	3
Year	76	50	[2] 101	[3] 10	52.9	40.1	67.5	[1]	4

[1] Less than half a day. [2] Mean annual highest temperature. [3] Mean annual lowest temperature.

TABLE 8.—*Probabilities of last freezing temperatures in spring and first in fall*

[Based on data from the Charleston station. Periods of record, 1911–22 and 1951–65. Adjustments made, if necessary, for years in which a temperature as low as indicated was not recorded]

Probability	24° F. or lower	28° F. or lower	32° F. or lower	36° F. or lower	40° F. or lower
Spring:					
1 year in 10 later than	March 19	April 2	April 16	April 24	May 13
2 years in 10 later than	March 11	March 26	April 11	April 19	May 8
5 years in 10 later than	February 22	March 13	April 3	April 12	April 26
Fall:					
1 year in 10 earlier than	October 31	October 26	October 17	October 4	September 27
2 years in 10 earlier than	November 6	October 30	October 21	October 9	October 3
5 years in 10 earlier than	November 16	November 8	October 29	October 19	October 13

The probabilities given in table 8 are based on temperature records at the Charleston weather station. The thermometer was 4½ feet above the ground, in a standard Weather Bureau instrument shelter. On clear, calm nights, the air in the shelter is several degrees warmer than the air near the ground, and frost can form on vegetation even though the temperature recorded in the shelter is above 32°. Also, the temperature can be above freezing and still be cold enough to have an adverse effect on seeds and on growing vegetation. For these reasons, the probabilities of 36° or 40° temperatures are included.

The relative humidity is 60 percent or higher 65 percent of the time and 40 percent or lower only 12 percent of the time. When the temperature is 90° F. or higher, the relative humidity seldom exceeds 80 percent but ranges between 50 percent and 80 percent about 25 percent of the time. Even when the temperature is lower than 50°, the relative humidity is greater than 50 percent more than half the time. The average relative humidity is 71 percent.

The percentage of possible sunshine ranges from 45 in January to 75 in August. The length of time between sunrise and sunset ranges from 9 hours and 52 minutes on December 21 to 14 hours and 30 minutes on June 21.

Thunderstorms occur on about 53 days each year and in all months. They are most common in July, when they occur on about 10 days. Severe thunderstorms accompanied with damaging winds occur about four times in 3 years. A damaging hailstorm can be expected somewhere in the county each year, and a tornado once in about 2 years.

Agriculture

The Choctaw Indians, who once inhabited Tallahatchie County, were chiefly hunters, but they grew corn, beans, melons, and pumpkins for food.

Cotton was grown extensively in the early 1800's. It was shipped from ports on the Tallahatchie River to Memphis and New Orleans. It remained the major crop until the middle 1930's. Recently, farming has become more diversified. Although cotton is still the principal cash crop, some of the acreage formerly in cotton is now in small grains, rice, and soybeans. Of increasing importance are livestock and truck crops.

The acreage of the principal crops in 1964 was as follows: Cotton harvested, 57,845; soybeans for all purposes, 79,803; corn for all purposes, 7,165; hay crops harvested, 5,263; oats harvested, 1,146; wheat and barley harvested, 2,686; and rice harvested, 253.

The numbers of livestock on farms in 1964 were as follows: Cattle, 24,249; hogs and pigs, 7,989; and chickens, 45,592.

The number of farms in 1964 was 1,486, and the average size was 220.8 acres. Full owners operated 577 of the farms, part owners 263, managers 5, and tenants 641.

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Glossary

Aggregate (soil structure). Many fine particles held in a single mass or cluster, such as a clod, crumb, block, or prism.

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

Association, soil. A group of soils geographically associated in a characteristic repeating pattern.

Available water capacity. The capacity of a soil to hold water in a form available to plants. Amount of moisture held in soil between field capacity, or about one-third atmosphere of tension, and the wilting coefficient, or about 15 atmospheres of tension.

Bedding planes. In sedimentary or stratified rocks, the division planes which separate the individual layers, beds, or strata.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay films. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

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

Complex, soil. A mapping unit consisting of different kinds of soils that occur in such small individual areas or in such an intricate pattern that they cannot be shown separately on a publishable soil map.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors, consisting of concentrations of compounds or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

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; will 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.

Contour farming. Plowing, cultivating, planting, and harvesting in rows that are at right angles to the natural direction of the slope or that are parallel to terrace grade.

Diversion. 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.

Fragipan. A loamy, brittle subsurface horizon that is very low in organic matter and clay but rich in silt or very fine sand. The layer is seemingly cemented when dry, has a hard or very hard consistence, and has a high bulk density in comparison with the horizon or horizons above it. When moist, a fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur 15 to 40 inches below the surface.

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 mottles 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 soluble salts, clay, or 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 by (1) accumulation of clay, sesquioxides, humus, or some combination of these; (2) prismatic or blocky structure; (3) redder or stronger colors than the A horizon; or (4) 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 in 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.

Loess. A fine-grained eolian deposit consisting dominantly of silt-sized particles.

Morphology, soil. The makeup of the soil, including the texture, structure, consistence, color, and other physical, mineralogical, and biological properties of the various horizons of the soil profile.

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.

Natural drainage. Refers to the conditions 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 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 horizon and upper B horizon and have mottling in the lower B horizon and the C horizon.

Imperfectly or somewhat poorly drained soils are wet for significant periods but not all the time, and in podzolic soils commonly have mottlings below depths of 6 to 16 inches in the lower A horizon and in the B and C horizons.

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.

Natural fertility. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors, such as light, moisture, temperature, and the physical condition (or tilth) of the soil are favorable.

Percolation. The downward movement of water through the soil.

Permeability, soil. 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.*

Phase, soil. A subdivision of a soil type, series, or other unit in the soil classification system, made because of differences that affect management but do not affect classification. A soil type, for example, may be divided into phases because of differences

in slope, stoniness, thickness, or some other characteristic that affects management.

Productivity, soil. The present capability of a soil for producing a specified plant or sequence of plants under a specified system of management.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction. 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		*pH*
Extremely acid	Below 4.5	Mildly alkaline	7.4 to 7.8
Very strongly acid	4.5 to 5.0	Moderately alkaline	7.9 to 8.4
Strongly acid	5.1 to 5.5	Strongly alkaline	8.5 to 9.0
Medium acid	5.6 to 6.0	Very strongly alkaline	9.1 and higher
Slightly acid	6.1 to 6.5		
Neutral	6.6 to 7.3		

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

Sand. As a soil separate, individual rock or mineral fragments ranging from 0.05 to 2.0 millimeters in diameter. Most sand grains consist of quartz, but sand may be of any mineral composition. As a textural class, soil that is 85 percent or more sand and not more than 10 percent clay.

Series, soil. A group of soils developed from a particular type of parent material and having genetic horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile.

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

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in a mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are as follows: *platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *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 profile below plow depth.

Surface layer. A term used in nontechnical soil descriptions for one or more layers above the subsoil. Includes the A horizon and part of the B horizon; has no depth limit.

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

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 a 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, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Type, soil. A subdivision of the soil series that is made on the basis of differences in the texture of the surface layer.

Undifferentiated soil group. Two or more soils or land types that are mapped as one unit because their differences are not significant to the purpose of the survey or to soil management.

Upland (geologic). 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.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

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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. Other information is given in text and tables as follows:

Acreage and extent, table 1, p. 5.
Estimated yields, table 2, p. 30.
Engineering uses of the soils, table 3, p. 38, and table 4, p. 42

Wildlife areas, pp. 48 and 49.
Recreational uses, table 5, p. 51.

Map symbol	Mapping unit	Described on page	Capability unit		Woodland suitability group	
			Symbol	Page	Number	Page
AcA	Alligator clay, 0 to 2 percent slopes	5	IIIw-6	28	1	32
Ad	Alligator clay, depressional	5	IVw-2	29	3	32
AsA	Alligator silty clay loam, 0 to 2 percent slopes	6	IIIw-4	27	1	32
Ca	Calhoun silt loam	7	IIIw-3	27	11	35
Cb	Calhoun-Bonn complex	7	IIIw-3	27	11	35
ClA	Calloway silt loam, 0 to 3 percent slopes	8	IIw-4	25	7	33
CmA	Cascilla silt loam, 0 to 3 percent slopes	9	I-2	24	13	35
Cn	Collins silt loam	9	I-2	24	8	34
Co	Collins silt loam, clayey subsoil variant	9	IIw-3	25	8	34
Cs	Crevasse and Bruno soils 1/	10				
	Crevasse	--	IVs-1	29	16	36
	Bruno	--	IIIw-5	28	16	36
DbA	Dubbs very fine sandy loam, 0 to 2 percent slopes	10	I-3	24	4	33
DbB	Dubbs very fine sandy loam, 2 to 5 percent slopes	10	IIe-1	25	4	33
DdA	Dundee silt loam, 0 to 2 percent slopes	11	I-3	24	5	33
DdB	Dundee silt loam, 2 to 5 percent slopes	11	IIe-1	25	5	33
DeA	Dundee silty clay loam, 0 to 2 percent slopes	11	IIw-1	25	5	33
DeB	Dundee silty clay loam, 2 to 5 percent slopes	11	IIe-4	25	5	33
DnC	Dundee soils, 5 to 8 percent slopes	11	IIIe-3	26	5	33
DtA	Dundee and Tensas silt loams, 0 to 3 percent slopes 1/	12				
	Dundee	--	I-3	24	5	33
	Tensas	--	IIw-1	25	5	33
Fa	Falaya silt loam	12	IIw-3	25	9	34
Fe	Falaya-Waverly association 1/	12				
	Falaya	--	IIw-3	25	9	34
	Waverly	--	IVw-2	29	15	36
Fo	Forestdale silt loam, depressional	13	IIIw-4	27	6	33
Fr	Forestdale silty clay loam, 0 to 3 percent slopes	13	IIIw-4	27	6	33
GrA	Grenada silt loam, 0 to 2 percent slopes	14	IIw-1	25	10	34
GrB2	Grenada silt loam, 2 to 5 percent slopes, eroded	14	IIe-3	25	10	34
GrC3	Grenada silt loam, 2 to 8 percent slopes, severely eroded	14	IVe-4	29	10	34
GuF	Gullied land-Memphis complex, 8 to 40 percent slopes	15	VIIe-3	29	17	37
LeA	Leverett silt loam, 0 to 2 percent slopes	15	I-2	24	12	35
LeB	Leverett silt loam, 2 to 5 percent slopes	15	IIe-3	25	12	35
LoA	Loring silt loam, 0 to 2 percent slopes	16	I-1	24	12	35
LoB2	Loring silt loam, 2 to 5 percent slopes, eroded	16	IIe-1	25	12	35
LoC2	Loring silt loam, 5 to 8 percent slopes, eroded	17	IIIe-1	26	12	35
LoD2	Loring silt loam, 8 to 12 percent slopes, eroded	17	IVe-1	28	12	35
MeA	Memphis silt loam, 0 to 2 percent slopes	17	I-1	24	13	35
MeB2	Memphis silt loam, 2 to 5 percent slopes, eroded	18	IIe-1	25	13	35
MeC2	Memphis silt loam, 5 to 8 percent slopes, eroded	18	IIIe-1	26	13	35
MeD2	Memphis silt loam, 8 to 12 percent slopes, eroded	18	IVe-1	28	13	35
MeD3	Memphis silt loam, 5 to 12 percent slopes, severely eroded	18	IVe-1	28	17	37
MeE	Memphis silt loam, 12 to 17 percent slopes	18	VIe-1	29	13	35
MeE3	Memphis silt loam, 12 to 17 percent slopes, severely eroded	18	VIe-1	29	17	37
MeF	Memphis silt loam, 17 to 40 percent slopes	19	VIIe-1	29	13	35
MeF3	Memphis silt loam, 17 to 40 percent slopes, severely eroded	19	VIIe-1	29	17	37
MnF	Memphis-Natchez complex, 17 to 40 percent slopes	19	VIIe-1	29	13	35
Ro	Rosebloom silt loam	20	IIIw-2	26	15	36
Sh	Sharkey clay	21	IIIw-6	28	1	32
TpA	Tippo silt loam, 0 to 2 percent slopes	22	IIw-4	25	7	33
TuA	Tutwiler very fine sandy loam, 0 to 3 percent slopes	22	I-1	24	2	32
TwB	Tutwiler-Bruno complex, 0 to 5 percent slopes	22	IIIw-5	28	2	32
Vc	Vicksburg silt loam	23	I-2	24	14	36
Vk	Vicksburg and Bruno soils 1/	23				
	Vicksburg	--	I-2	24	14	36
	Bruno	--	IIIw-5	28	16	36
Wv	Waverly silt loam	23	IIIw-2	26	15	36

1/ The composition of these mapping units is more variable than that of the other units in the county but has been controlled well enough to allow interpretations for the expected uses of the soils.