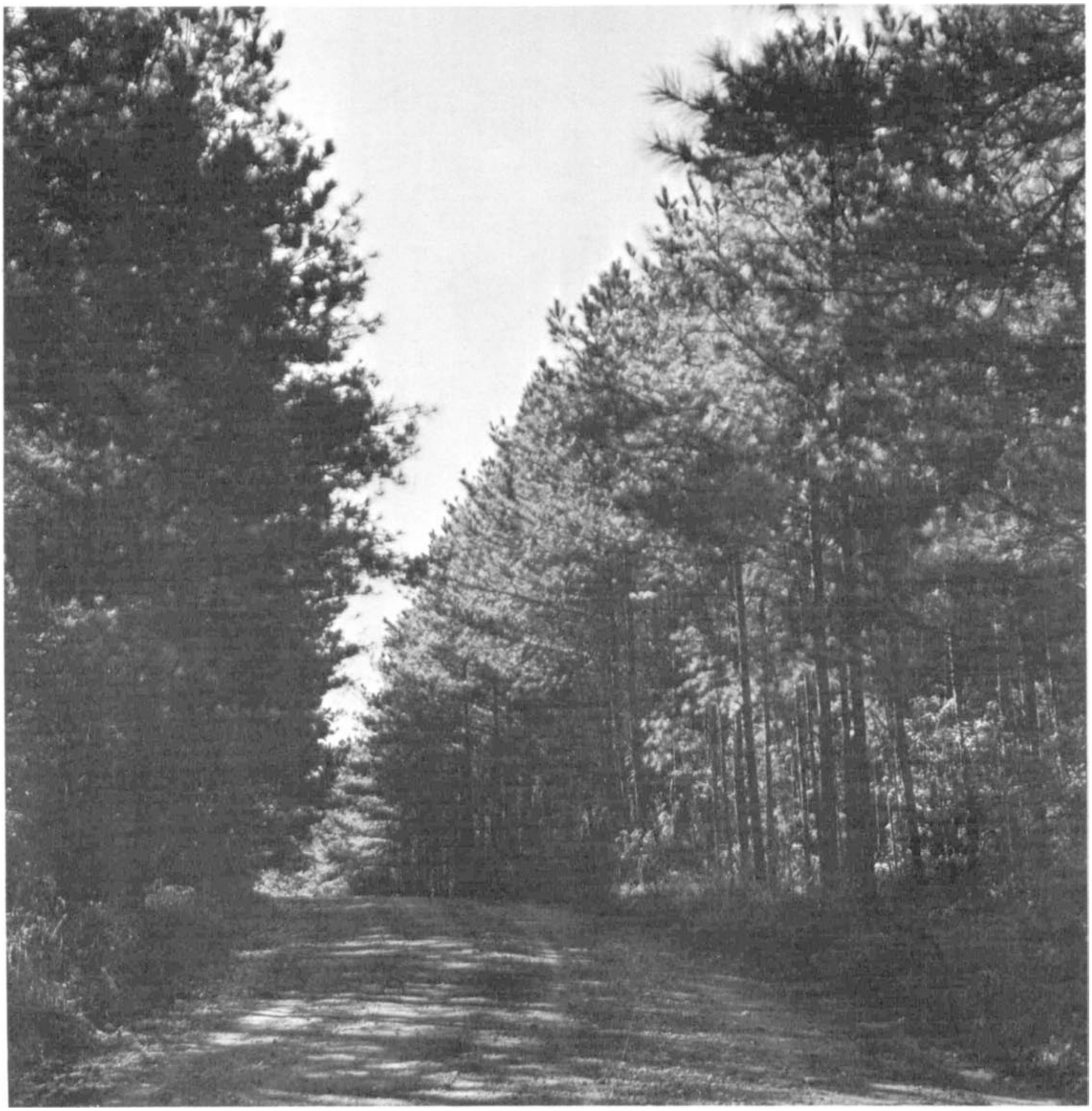
United States Department of Agriculture

Soil Conservation Service

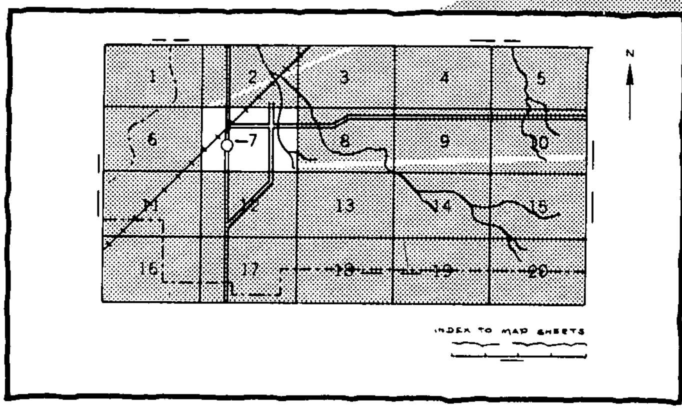
In Cooperation with Mississippi Agricultural and Forestry Experiment Station

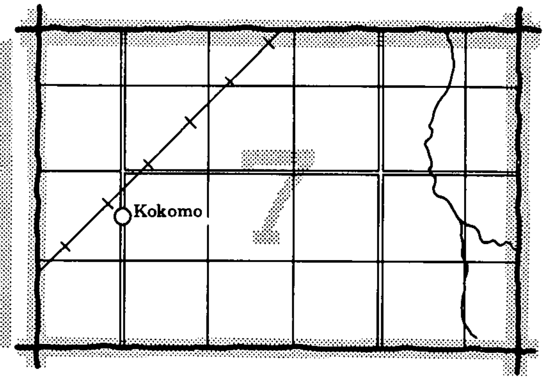
Soil Survey of Tishomingo County Mississippi



HOW TO USE

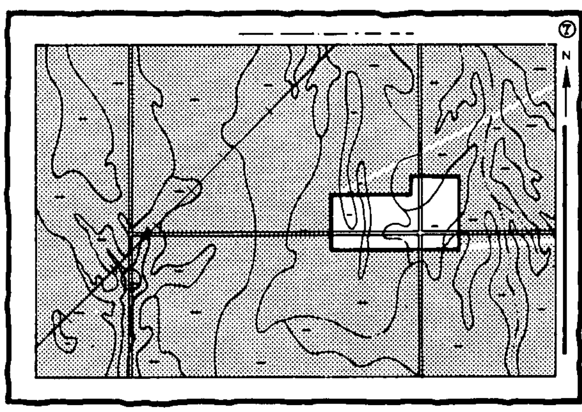
1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).

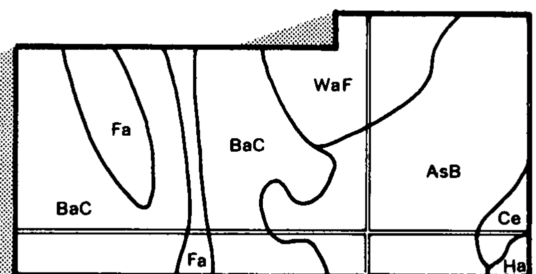




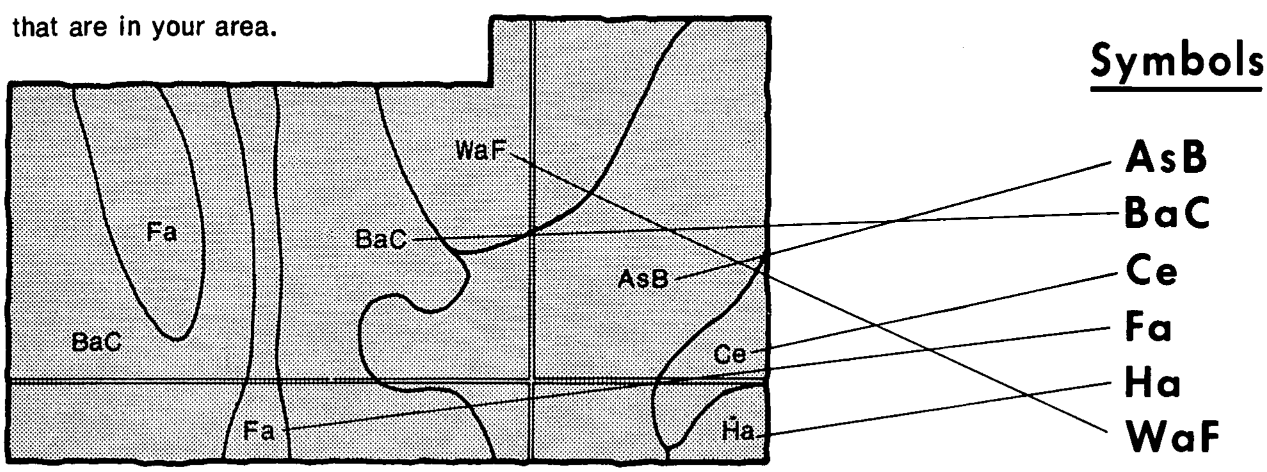
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.



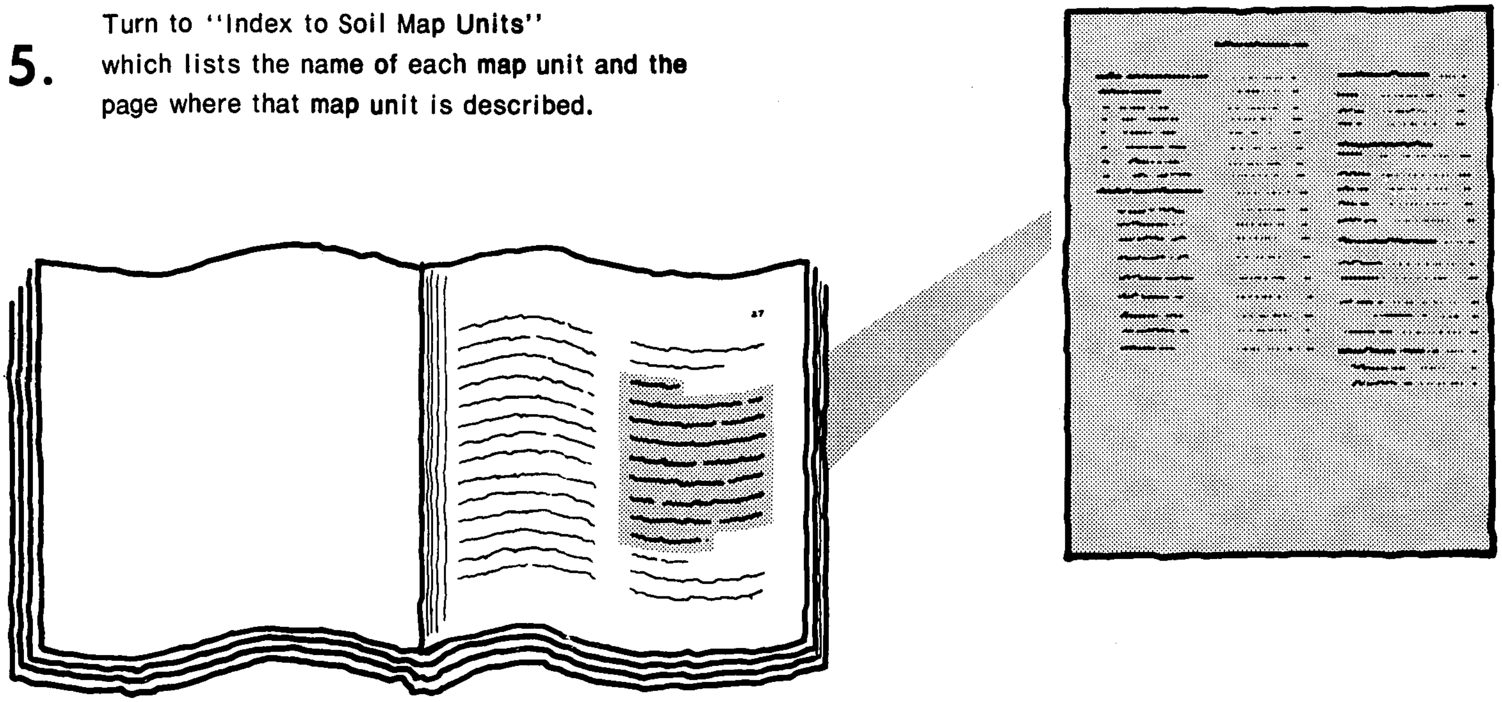


4. List the map unit symbols that are in your area.

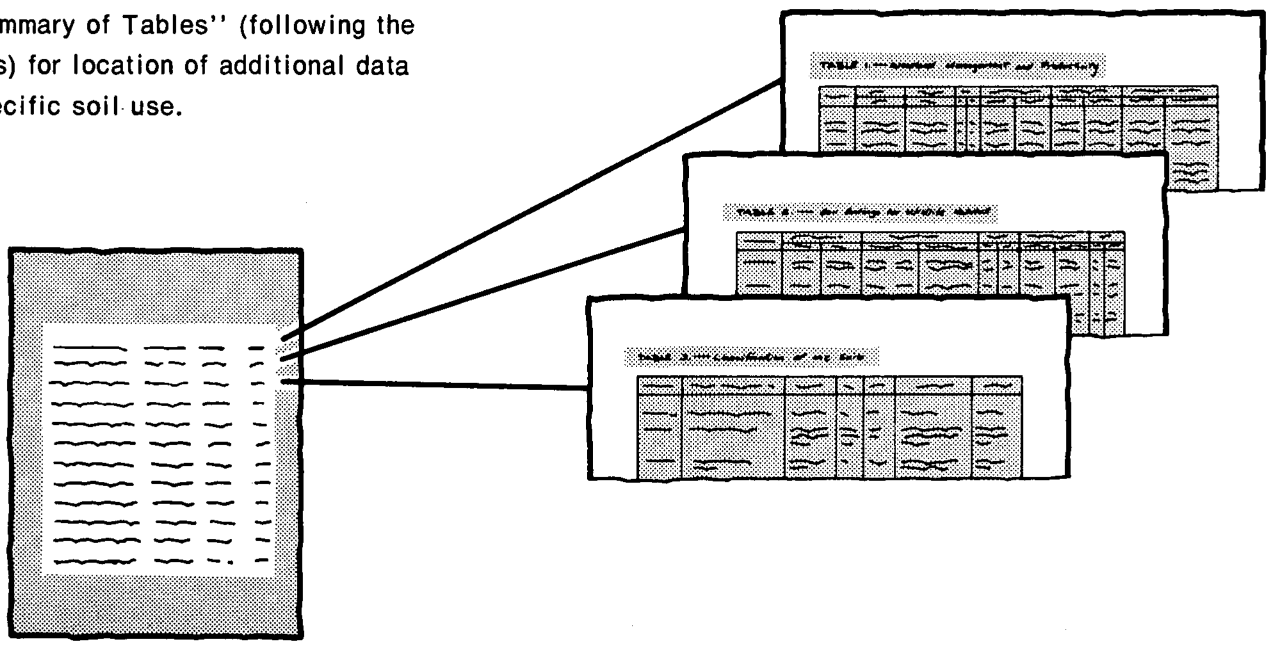


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

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

Major fieldwork for this soil survey was performed in the period 1972-1980. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1980. This survey was made cooperatively by the Soil Conservation Service and the Mississippi Agricultural and Forestry Experiment Station. It is part of the technical assistance furnished to the Tishomingo County Soil and Water Conservation District.

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

Cover: Loblolly pine forest in an area of Smithdale-Ruston association, hilly.

contents

soil series

Issued October 1983

index to soil map units

summary of tables

foreword

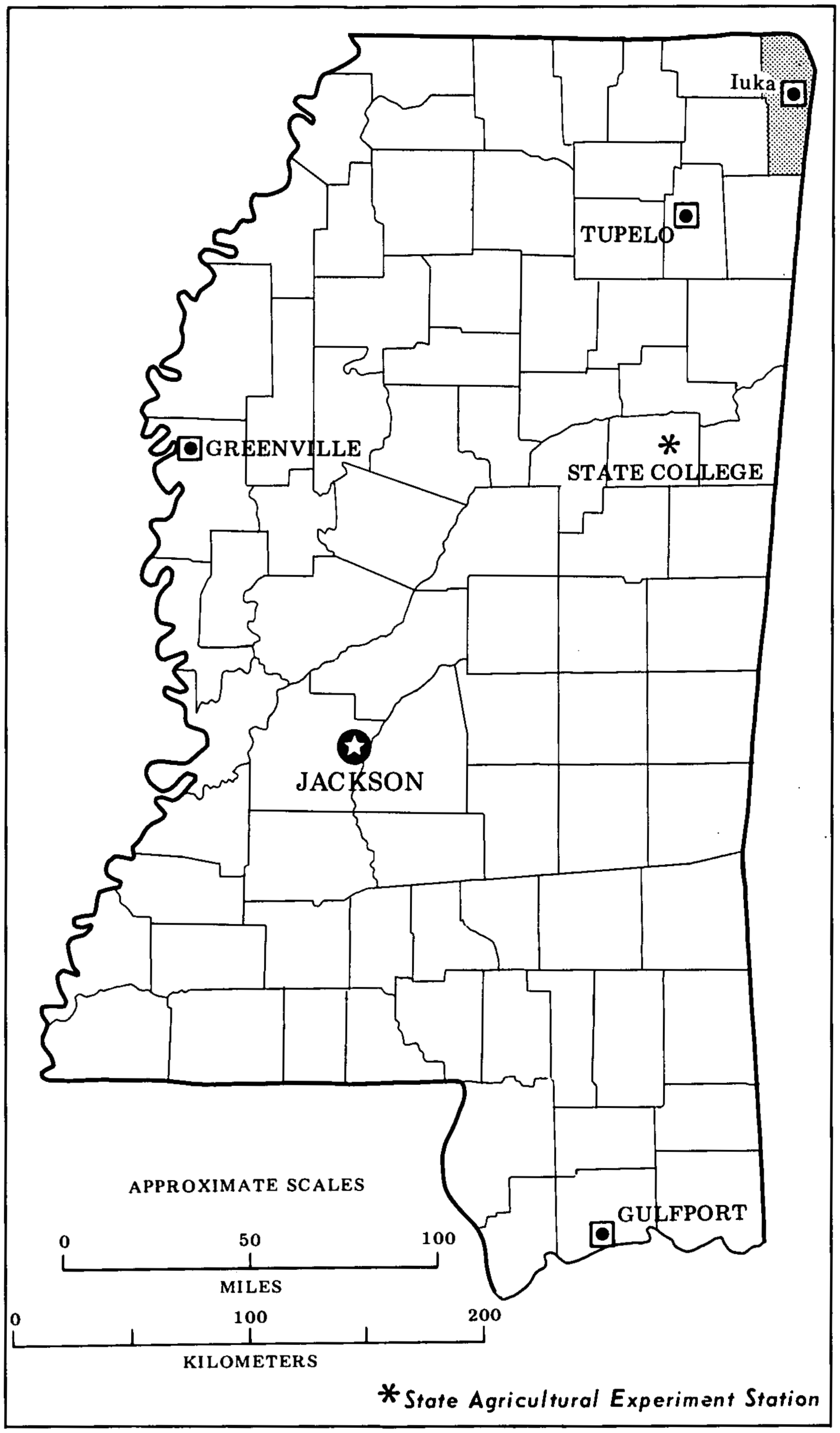
This soil survey contains information that can be used in land-planning programs in Tishomingo County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact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

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

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

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

Billy C. Griffin
State Conservationist
Soil Conservation Service



Location of Tishomingo County in Mississippi.

soil survey of
Tishomingo County, Mississippi

By Karl H. Miller, Soil Conservation Service

Soils surveyed by Karl H. Miller and L. C. Murphree
Soil Conservation Service

United States Department of Agriculture
Soil Conservation Service
in cooperation with
Mississippi Agricultural and Forestry Experiment Station

TISHOMINGO COUNTY is in the northeastern corner of Mississippi. In 1970, Iuka, the county seat, had a population of about 2,389, and the county had a population of about 14,940. The total land area of Tishomingo County is about 279,640 acres, or about 436 square miles. The county is over 36 miles long and over 15 miles wide.

The county is bounded on the south by Itawamba County, on the west by Prentiss and Alcorn Counties, on the north by Hardin County, Tenn., and on the east by Lauderdale, Colbert, and Franklin Counties, Ala.

Forest products and crops, mainly soybeans, are the most important agricultural sources of income in the county.

An older survey of Tishomingo County was published in 1944 (*7*). The present survey updates the earlier survey and provides additional information and larger maps.

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

general nature of the survey area

This section provides information about physiography, climate, landscape resource, natural resources, water resources, and geology.

physiography

Tishomingo County lies mostly within the Coastal Plain physiographic province of the United States. The elevation of the county ranges from about 400 to 806 feet. Woodall Mountain, the highest point in Mississippi, 806 feet above sea level, is approximately 2 miles southwest of Iuka. The elevation at Pickwick Lake is 414 feet. One of the lowest points is 407 feet, at the gaging station on Seven Mile Creek, in the northwestern part of the county.

The land surface is mostly dissected, and many of the uplands are steeply sloping. Ridgetops are narrow in many areas. In a rather narrow belt extending from Iuka to the Itawamba County line in the vicinity of Belmont, the topography is predominantly sloping to strongly sloping; and between Belmont and Golden, there is an area of about 9 square miles that is nearly level to sloping. A few areas of wide terraces are along Bear Creek and Yellow Creek.

Natural drainage in Tishomingo County is generally good in the uplands. Drainage in the bottom lands is fair to poor. About three-fourths of the county is drained by the Tennessee River and the rest by the Tombigbee River.

climate

Prepared by the National Climatic Center, Asheville, N.C.

Tishomingo County has long hot summers and rather cool winters. An occasional cold wave brings near-freezing or sub-freezing temperatures but seldom much snow. Precipitation is fairly heavy throughout the year, and the prolonged droughts are rare. Summer precipitation falls mainly in afternoon thunderstorms, and it is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Booneville, Miss., in the period 1951 to 1973. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 42° F, and the average daily minimum temperature is 31°. The lowest temperature on record, which occurred at Booneville on January 12, 1962, is -5°. In summer the average temperature is 78°, and the average daily maximum temperature is 90°. The highest recorded temperature, which occurred on July 28, 1952, is 108°.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50° F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 52 inches. Of this, 24 inches, or 45 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 18 inches. The heaviest 1-day rainfall during the period of record was 4.38 inches at Booneville on March 15, 1964. Thunderstorms occur on about 50 days each year, and most occur in summer.

Average seasonal snowfall is 4 inches. The greatest snow depth at any one time during the period of record was 7 inches. In an average year, at least 1 inch of snow is on the ground at least 1 day. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 75 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 11 miles per hour, in winter.

landscape resource

Ernest E. Dorrill, III, landscape architect, Soil Conservation Service, helped prepare this section.

The Tishomingo County landscape is changing dramatically, primarily in the area of construction for the Tennessee-Tombigbee Waterway. Also, construction of the Yellow Creek Nuclear Plant is contributing to considerable landscape change. All this construction and the Pickwick Lake resort area are creating urban expansion. One of the most outstanding areas in terms of a stable landscape resource is in Tishomingo State Park, where massive sandstone outcroppings characterize the landscape.

The landscape resource has three aspects: ecological, social, and visual. The ecological aspect is determined by the processes that have formed and shaped the landscape in its entirety. The social resource is the use of the landscape for economic and other cultural purposes. The visual resource is the classifiable appearance of the landscape.

The visual resource can be described and measured by four elements: landform, water, vegetation, and structures. These elements and their pattern determine the visual diversity of a landscape. In the "General soil map units" section, each map unit has been rated for visual diversity and for the visual contrast that changes in the land use may create.

The landscape resource should be considered along with soil capability in planning land use. Some land use changes may introduce the hazard of erosion, which can contribute to the decline of landscape quality. Planting crops on land that is not suited and not providing ground cover in the winter could result in deep rills and gullies. Sand and silt from such eroding soils could clog streams and result in a decrease in visual quality. Urban structures, including roads, highways, and utilities, alter the appearance of the landscape. Land use changes from farming and timber production to urban uses are becoming commonplace in the county. Generally, these changes determine the landscape resource.

natural resources

About 191,400 acres, or 68 percent, of the land area of Tishomingo County is in forest. Pine and low grade hardwood are on the uplands, and hardwood is on the flood plains. Most of the wood from these forests is used for paper, lumber, and plywood products.

Gravel and sand are mined in the county. Most of the sand and gravel is used in the construction of local roads.

A limestone mine in the east-central part of the county is a source for the majority of the rocks used for rip-rap along the Tennessee-Tombigbee Waterway.

A stone quarry in the southeastern part of the county is a source of sandstone used in construction of buildings in the county and in the surrounding area.

water resources

The water supply is adequate for agricultural, industrial, and residential uses in the county. Industries and town residents receive their water from deep wells and reservoirs. Numerous springs and streams are sources for agricultural and municipal uses. Many farm ponds are also available for agricultural purposes. In recent years, many communities have installed water systems that pump water from deep wells. Those farms and homes not on community systems obtain water from individual shallow or deep wells. A few artesian wells are in the county.

Pickwick Lake is an important artificial lake for transportation, power generation, and recreational uses. It covers all of the former Tennessee River flood plain lying within the county. The northern terminus of the Tennessee-Tombigbee Waterway, a barge canal (fig. 1), is in Tishomingo County where the waterway joins the Tennessee River. The waterway extends southward through the county.

geology

Nearly all of the county is underlaid by unconsolidated material of sand and gravel and a small amount of silt and clay. The Eutaw Formation, which underlies most of the western two-thirds of the county, consists chiefly of sands and clays. The Tuscaloosa Formation, which underlies the eastern one-third of the county, consists chiefly of gravel and sand. Gravel beds occur throughout this formation, and large amounts have been mined in the area east and southeast of luka.

Both the Tuscaloosa and Eutaw Formations belong to the Upper Cretaceous geologic period. The unconsolidated material rests upon consolidated sedimentary rocks of the Mississippian and Devonian Periods of the Paleozoic Era. These rocks outcrop along the bluffs of some of the larger streams, such as the Tennessee River, Bear Creek, Mackeys Creek, and some of the short branches in the northeastern part of the county (*3, 4, 5, 10*).

how this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study 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, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this

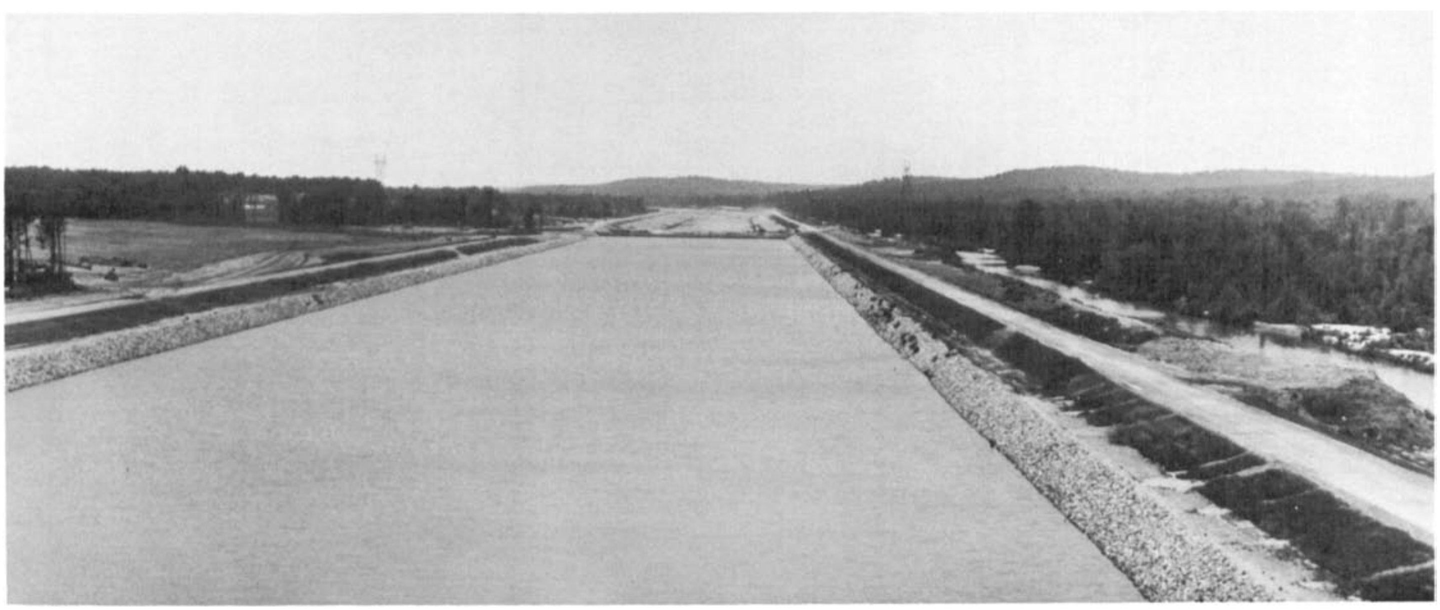


Figure 1.—The Tennessee-Tombigbee Waterway viewed from a bridge on State Highway 25. Mantachie loam is the dominant soil in the area adjoining the canal.

survey area are described under "General soil map units" and "Detailed soil map units."

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteristics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, woodland managers, engineers, planners, developers and builders, home buyers, and others.

general soil map units

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

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

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

Descriptions of the general soil map units follow.

1. Mantachie-Kirkville

Nearly level, somewhat poorly drained and moderately well drained loamy soils; on flood plains

The landscape is characterized by very little relief, primarily nearly level flood plains. Slopes range from 0 to 2 percent. Major streams are winding and have a continuous flow. Gravel and rock in stream beds are common, and some areas of the streams have riffles and vertical banks. Numerous beaver ponds are in tributaries of major streams. Most of the acreage of this unit is used as cropland, primarily in the higher lying areas; some acreage in the lower lying areas is in woodland that has small openings of cropland and pasture. There are few farm and rural structures. Based on the pattern of these landscape elements, visual diversity is moderate to high. Land use changes will produce a high degree of contrast.

This map unit makes up about 10 percent of the county. It is about 68 percent Mantachie soils, 17 percent Kirkville soils, and 15 percent minor soils.

The somewhat poorly drained loamy Mantachie soils and the moderately well drained loamy Kirkville soils are throughout the unit. Both soils, on flood plains, have seasonal high water tables. Minor soils in this unit are the well drained Jena soils on flood plains and the moderately well drained Savannah soils and the somewhat poorly drained Quitman soils on stream terraces.

The soils making up this map unit are mainly used for crops and pasture; small acreages are still in woodland. These soils are well suited to row crops and pasture plants, although occasional flooding of these soils causes slight or moderate crop damage. These soils are well suited to woodland. These soils have good potential for use as habitat for openland and woodland wildlife. Mantachie soils have fair potential and Kirkville soils have poor potential for wetland wildlife habitat.

2. Mantachie-Savannah-Jena

Nearly level to gently sloping, somewhat poorly drained to well drained loamy and silty soils, some have a fragipan; on flood plains and terraces

The landscape is characterized by very little relief, primarily nearly level to gently sloping terraces and narrow flood plains. Slopes range from 0 to 5 percent. The landscape has a well-defined, dendritic drainage pattern. The winding intermittent streams have outcrops of sandstone in their banks. Bear Creek, which has clear water, a gravel bottom, and limestone outcroppings, is the prominent stream. Numerous beaver ponds are in tributaries of major streams. Most of the acreage is used for crops; some wooded acreage parallels major streams. Farm and rural structures are common. Based on the pattern of these landscape elements, visual diversity is moderate to high. Land use changes will produce a low to moderate amount of contrast.

This map unit makes up about 6 percent of the county. It is about 32 percent Mantachie soils, about 28 percent Savannah soils, 20 percent Jena soils, and about 20 percent minor soils.

The somewhat poorly drained loamy Mantachie soils are on the lower parts of flood plains and in most places away from the stream channels. The Savannah soils are on the terraces. They are moderately well drained silty soils that have a fragipan. The well drained silty Jena soils are on the higher parts of flood plains near stream channels. Minor soils in this unit are the well drained Ruston soils and the moderately well drained Ora soils, both on uplands.

The soils making up this map unit are used for crops or pasture; a small acreage is in woodland. Mantachie, Savannah, and Jena soils are well suited to row crops and pasture plants. Mantachie and Jena soils are well suited to woodland, but wetness and flooding are limitations. Savannah soils are suited to woodland. Potential for habitat for openland wildlife is good on Mantachie and Savannah soils and fair on Jena soils. Potential is good for habitat for woodland wildlife on Mantachie, Savannah, and Jena soils. For use as habitat for wetland wildlife, the Mantachie soils have fair potential, the Savannah soils have very poor potential, and the Jena soils have poor potential.

3. Ruston-Ora-Savannah

Gently sloping to strongly sloping, well drained and moderately well drained loamy and silty soils, some have a fragipan; on uplands

The landscape is characterized by varied relief, primarily broad gently sloping ridgetops and strongly sloping hillsides. Slopes range from 2 to 12 percent. Narrow flood plains border winding, intermittent streams. The landscape has a well-defined, dendritic drainage pattern. The land is used for woodland and cropland. There are few farm and rural structures. Based on the pattern of these landscape elements, visual diversity is high. Land use changes will produce moderate contrast.

This map unit makes up about 18 percent of the county. It is about 60 percent Ruston soils, 14 percent Ora soils, 12 percent Savannah soils, and 14 percent minor soils.

The well drained loamy Ruston soils are on the ridges and hillsides. The loamy Ora soils and the silty Savannah soils are intermingled on the broad ridgetops and terraces, are moderately well drained, and have a fragipan. The minor soils include areas of well drained Smithdale soils on hillsides, and moderately well drained Paden soils on ridges.

The soils making up this map unit are used for row crops and pasture. A small acreage is in woodland. Gently sloping areas of Ruston, Ora, and Savannah soils are well suited to crops and pasture and suited to woodland. Sloping areas of these soils are suited to crops, pasture, and woodland. Strongly sloping areas of Ora soils are poorly suited to cropland, but they are suited to pasture and woodland. These soils have good potential for use as habitat for openland and woodland wildlife. For wetland wildlife habitat, potential is very poor or poor.

4. Smithdale-Ruston-Ora

Gently sloping to steep, well drained and moderately well drained loamy soils, some have a fragipan; on uplands

The landscape is characterized by prominent relief, mainly hills and ridges. The hillsides are steep, and the ridges are moderately undulating. Slopes range from 2 to 40 percent. The drainage pattern is dendritic. Well-defined stream channels, mostly with intermittent flow, wind through narrow flood plains. Most of the acreage of this unit is in forest, mainly pine. A few small areas, mainly on ridgetops, are used for crops. There are few farm and rural structures. Based on the pattern of these landscape elements, visual diversity generally is low, except in a 40-acre area which has 140-year-old virgin pine. Land use changes will produce high visual contrast.

This map unit makes up about 57 percent of the county. It is about 57 percent Smithdale soils, 24 percent Ruston soils, 5 percent Ora soils, and 14 percent minor soils.

The well drained loamy Smithdale soils are on hillsides. The moderately well drained loamy Ora and the well drained loamy Ruston soils are on the ridgetops and upper part of hillsides. The Ora soils have a fragipan. Minor soils in this map unit are the moderately well drained Savannah soils on ridges and the somewhat poorly drained Mantachie soils on flood plains.

The soils making up this map unit are used primarily for woodland, mainly pine and hardwood. Some acreage is used for pasture or crops. The narrow valleys and ridgetops are used mostly for pasture and row crops. Gently sloping Ruston and Ora soils of this map unit are well suited to row crops and pasture, and sloping areas are suited. Steep areas are poorly suited to row crops and to pasture because of the hazard of erosion and poor productivity. Smithdale, Ruston, and Ora soils are suited to woodland. The potential for use as habitat for openland wildlife is fair for Smithdale soils and good for Ruston and Ora soils. For woodland wildlife habitat, potential is good; and for wetland wildlife habitat, potential is very poor or poor.

5. Saffell-Smithdale

Strongly sloping to steep, well drained gravelly and loamy soils; on uplands

The landscape is characterized by prominent relief, mainly hills and ridges. The hillsides are steep, and the ridges are moderately undulating. Slopes range from 8 to 40 percent. The drainage pattern is dendritic. The streams have well-defined channels, mostly with intermittent flow, and they wind through narrow flood plains. Most of the acreage is in forest, mainly pine. A few small areas, mainly on ridgetops, are used for crops. There are few farm and rural structures, except there are numerous vacation cottages and homes adjacent to Pickwick Lake. Based on the pattern of these landscape elements, visual diversity is generally low. Land use changes will produce a high amount of contrast.

The map unit makes up about 9 percent of the county. It is about 38 percent Saffell soils, 38 percent Smithdale soils, and 24 percent minor soils.

The well drained gravelly Saffell soils are on the middle and lower parts of hillsides. The well drained loamy Smithdale soils are on the upper parts of hillsides and ridgetops. Minor soils in this unit are the moderately well drained Ora soils and the well drained Ruston soils on ridgetops and upper parts of hillsides and the somewhat poorly drained Mantachie soils on the flood plains.

The soils making up this map unit are mainly in woodland; a small acreage is used for pasture and crops. Saffell and Smithdale soils are poorly suited to row crops and pasture because of steepness of slopes, low productivity, and the hazard of erosion. Saffell soils are poorly suited to woodland and Smithdale soils are suited. The potential for use as habitat for openland wildlife is poor for Saffell soils and fair for Smithdale soils. Saffell soils have fair potential and Smithdale soils have good potential for woodland wildlife habitat. Saffell and Smithdale soils have very poor potential for wetland wildlife habitat.

detailed soil map units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and management of the soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Ruston sandy loam, 2 to 5 percent slopes, eroded, is one of several phases in the Ruston series.

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

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Rock outcrop-Smithdale complex, 15 to 30 percent slopes, is an example.

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

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Descriptions of the detailed soil map units follow.

Gu—Guyton silt loam. This is a nearly level, poorly drained soil. It formed in loamy material on terraces and broad upland flats. Slopes range from 0 to 1 percent.

Typically, the surface layer is grayish brown silt loam about 5 inches thick. The subsurface layer is gray silt loam that has yellowish brown mottles to a depth of about 10 inches. To a depth of about 15 inches, it is gray silt loam that has strong brown and yellowish brown mottles. The subsoil extends to a depth of 64 inches or more. To a depth of about 23 inches, it is gray silty clay loam that has strong brown mottles and has tongues of gray silt loam. From 23 to 30 inches, it is grayish brown silty clay loam that has yellowish brown mottles, and from 30 to 43 inches, it is grayish brown silt loam that has yellowish brown and brown mottles. Below that, it is gray silt loam that has yellowish brown mottles.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is slow, and in winter and spring a high water table is perched between 1 ½ feet and the surface. Available water capacity is high. Runoff is slow, and erosion is a slight hazard.

Included with this soil in mapping are small areas of Paden soils on low knolls and side slopes, and small areas of soils similar to Guyton soils except that they have a higher content of sodium in the upper part of the subsoil. The included soils make up about 10 to 15 percent of the map unit.

Most of the acreage is used as pasture or woodland. This soil is suited to row crops. Returning crop residue to the soil improves soil fertility and tilth and reduces crusting and packing. Surface field ditches are needed, and plant rows should be arranged to remove excess surface water.

This soil is suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes some surface compaction by livestock and poor tilth. Proper stocking and controlled grazing reduce compaction and help maintain tilth.

This soil is well suited to loblolly pine, sweetgum, and water oak. Seasonal wetness is a limitation in managing and harvesting the tree crop; this can be partly overcome by logging during drier seasons.

This soil has fair potential for use as habitat for openland and woodland wildlife and good potential for habitat for wetland wildlife.

Wetness and low strength for streets and roads are severe limitations for community development. Septic tank absorption fields are likely to malfunction in this soil because the high water table is near the surface in wet seasons and because of the slow permeability of the subsoil.

This Guyton soil is in capability subclass IIIw and in woodland suitability group 2w9.

Je—Jena silt loam. This is a well drained, nearly level soil. It formed in loamy alluvium on flood plains. This soil is occasionally flooded for brief periods. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil extends to a depth of 29 inches. To a depth of about 14 inches, it is yellowish brown silt loam. To a depth of about 29 inches, it is yellowish brown loam that has pale brown mottles. The underlying material to a depth of 65 inches is dark yellowish brown loamy sand mottled in shades of brown.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the subsoil and moderately rapid in the underlying material. Available water capacity is medium. Runoff is slow, and erosion is a slight hazard. In most years, this soil is flooded several times for brief periods late in winter and early in spring before summer field crops are planted; this soil is rarely flooded during the summer growing season. The seasonal high water table is more than 6 feet below the surface.

Included with this soil in mapping are small areas of Kirkville and Mantachie soils in slightly lower positions on flood plains. Also included are narrow areas of poorly drained loamy soils in old channels and sloughs. The included soils make up about 5 to 10 percent of the map unit.

Most of the acreage is used for crops and pasture except for scattered tracts of woodland. This soil is well suited to row crops. Flooding during the spring planting season is the main limitation. Crop residue or other sufficient ground cover should be maintained in the fall to prevent soil scouring by overflow during the wet season.

This soil is well suited to grasses and legumes for hay and pasture. The plants effectively help control erosion. Proper stocking, controlled grazing, and weed and brush control help keep the soil in good condition.

The soil is well suited to loblolly pine, shortleaf pine, sweetgum, and water oak. Flooding limits the use of equipment in winter and spring.

This soil has fair potential for use as habitat for openland wildlife, good potential for habitat for woodland wildlife, and poor potential for habitat for wetland wildlife.

Flooding is a severe limitation for community development and for proper function of septic tank absorption fields in the soil.

This Jena soil is in capability subclass IIw and in woodland suitability group 1o7.

Kr—Kirkville loam. This is a moderately well drained, nearly level soil. It formed in loamy alluvium on flood plains. This soil is subject to occasional flooding for brief periods late in winter and early in spring. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark grayish brown loam about 6 inches thick. The subsoil extends to a depth of 65 inches or more. To a depth of about 18 inches, it is yellowish brown sandy loam. To a depth of about 40 inches, it is yellowish brown sandy loam that has light brownish gray mottles. Below that, it is gray loam mottled in shades of brown and red.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate. A high water table fluctuates between depths of 1 1/2 and 2 1/2 feet late in winter and early in spring. Available water capacity is medium. Runoff is slow, and erosion is a slight hazard. In spring this soil does not dry as soon as the well drained soils on the adjacent terraces and uplands. Seedbed preparation and tillage are delayed because of wetness and flooding.

Included in mapping are small areas of Jena and Mantachie soils on slightly higher elevations of the flood plains. These soils make up about 10 to 15 percent of the map unit.

Most of the acreage is used for pasture and crops; some scattered tracts are used as woodland. This soil is well suited to row crops (fig. 2). Surface field ditches are needed, and plant rows should be arranged to remove excess surface water. Returning crop residue to the soil helps maintain soil fertility and tilth.

This soil is well suited to grasses and legumes for hay and pasture. Proper stocking and controlled grazing help maintain soil tilth.

This soil is well suited to loblolly pine, sweetgum, yellow-poplar, cherrybark oak, and water oak. Wetness and flooding are limitations in managing and harvesting of trees.

This soil has good potential for use as habitat for openland and woodland wildlife and poor potential for habitat for wetland wildlife.

Flooding and wetness are severe limitations for community development and proper function of septic tank absorption fields in this soil.

This Kirkville soil is in capability subclass IIw and in woodland suitability group 1w8.

Ma—Mantachie loam. This is a nearly level, somewhat poorly drained soil. It formed in loamy material on flood plains and in drainageways. This soil is subject to flooding late in winter and early in spring. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark brown loam about 6 inches thick. The subsoil extends to a depth of 65 inches or more. To about 11 inches, it is dark yellowish brown loam. To about 18 inches, it is dark brown loam mottled with light brownish gray. To about 36 inches, it is gray loam. To a depth of about 48 inches, it is light brownish gray loam mottled in shades of brown. Below that, it is gray loam mottled with strong brown.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate, and available water capacity is high. Late in winter and early in spring, a high water table fluctuates between 1 foot and 1 1/2 feet of the surface. Runoff is slow, and erosion is a slight hazard. Scouring occurs during flooding of this soil.

Included with this soil are small areas of Jena and Kirkville soils in similar positions. These soils make up about 10 to 15 percent of this map unit.

Most of the acreage is used for pasture or row crops; a small acreage is in woodland. This soil is well suited to row crops. Returning crop residue to the soil, minimum tillage, and crop rotation help maintain fertility and good tilth. Diversion ditches, surface field ditches, and planting rows to control surface water are needed.

This soil is well suited to grasses and legumes for hay and pasture. Proper stocking, controlled grazing, and

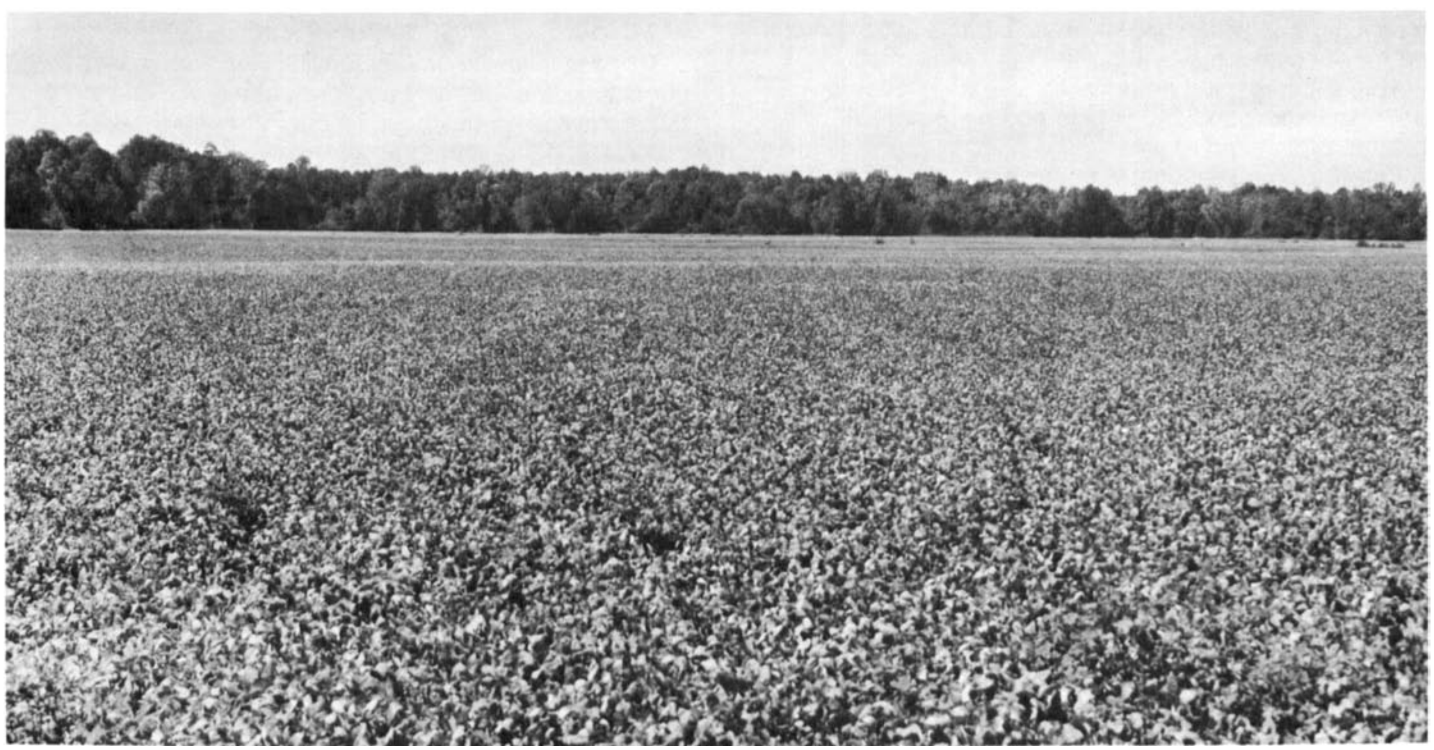


Figure 2.—Soybeans growing on Kirkville loam.

Figure 3.—Baled hay from Coastal bermudagrass on Ora loam, 2 to 5 percent slopes, eroded.

weed and brush control help maintain soil fertility and tilth.

This soil is well suited to loblolly pine, cherrybark oak, yellow-poplar, and sweetgum. Flooding is a limitation in managing and harvesting of trees, but this limitation can be mostly overcome by logging in dry seasons.

This soil has good potential for use as habitat for openland and woodland wildlife and fair potential for habitat for wetland wildlife.

Flooding and seasonal wetness are severe limitations for community development and proper function of septic tank absorption fields in this soil.

This Mantachie soil is in capability subclass IIw and in woodland suitability group 1w8.

OrB2—Ora loam, 2 to 5 percent slopes, eroded. This is a moderately well drained, gently sloping soil that has a fragipan. It formed in loamy marine sediment on ridgetops on uplands.

Typically, the surface layer is yellowish brown loam about 6 inches thick. The subsoil extends to about 47 inches. To a depth of about 25 inches, it is yellowish red clay loam. The layer below this to a depth of about 47 inches is a fragipan that is loam in the upper part and sandy clay loam in the lower part and is mottled throughout in shades of red, brown, yellow, and gray. The underlying material is mottled red, yellowish brown, yellowish red, and light gray loam to a depth of 70 inches.

In most areas the surface layer is a mixture of topsoil and subsoil because erosion has removed part of the original surface. In places, all of the original topsoil has been removed, and the plow layer is subsoil. In other places, the plow layer is mostly the original surface layer. Some fields have a few rills and shallow gullies; these are mostly in drainageways where water collects.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. During wet seasons, a high water table fluctuates between 2 and 3 1/2 feet of the surface or is perched above the fragipan. Available water capacity is medium. Runoff is slow to medium. Erosion is a slight to moderate hazard. Rooting depth and the movement of air and water through the soil are restricted by the fragipan.

Included in mapping are small areas of soils that have slopes of more than 5 percent. Also included in mapping are small areas of Ruston, Savannah, and Smithdale soils on landscape positions similar to those of this Ora soil. The included soils make up about 10 to 15 percent of this map unit.

Most of the acreage is used for pasture or row crops. Some acreage is in woodland. This soil is well suited to row crops. Returning crop residue to the soil, minimum tillage, crop rotation, contour farming, terracing, and vegetated waterways slow runoff and control erosion. Erosion on this soil is very damaging in that loss of surface soil has the effect of bringing the fragipan closer to the surface, which reduces the available water capacity and depth to which the roots can penetrate.

This soil is well suited to grasses and legumes for hay (fig. 3) and pasture. Overgrazing the pasture causes excessive runoff and increases the erosion hazard. Proper stocking, controlled grazing, and weed and brush control help control erosion and slow runoff.

This soil is suited to loblolly pine, shortleaf pine, and sweetgum. Limitations to woodland management are slight except for moderate plant competition.

This soil has good potential for use as habitat for openland and woodland wildlife and poor potential for wetland wildlife habitat.

This soil has moderate limitations for community development. Wetness and low strength for streets and roads are limitations. Because of the moderately slow permeability of the fragipan and wetness, this soil has severe limitations for septic tank absorption fields.

This Ora soil is in capability subclass IIe and in woodland suitability group 3o7.

OrC2—Ora loam, 5 to 8 percent slopes, eroded. This is a moderately well drained, sloping soil that has a fragipan. It formed in loamy marine sediment on ridgetops on uplands.

Typically, the surface layer is yellowish brown loam about 3 inches thick. The subsoil extends to a depth of 48 inches. To a depth of about 20 inches, it is yellowish red loam. Below this to a depth of 48 inches is a fragipan that is mottled in shades of red, yellow, brown, and gray. From 20 to 36 inches, the fragipan is loam, and from 36 to 48 inches, it is sandy clay loam. The underlying material to a depth of 60 inches is yellowish red sandy loam.

In most places, the plow layer is a mixture of the surface layer and subsoil because erosion has removed part of the original surface. In places, all of the original surface layer has been removed, and the plow layer is subsoil. In other places, the plow layer is mostly the original surface layer. Some fields have a few rills and shallow gullies that extend into the fragipan.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. During wet seasons, a high water table fluctuates between 2 and 3 1/2 feet of the surface or is perched above the fragipan. Available water capacity is medium. Runoff is medium, and erosion is a moderate hazard. The depth to which roots can penetrate and the movement of air and water through the soil are restricted by the fragipan.

Included in mapping are small areas of Ruston, Savannah, and Smithdale soils in similar positions to this Ora soil and a few areas of soils that have slopes greater than 8 percent. Included soils make up about 10 to 15 percent of the map unit.

Most of the acreage is used for pasture or row crops; some small tracts are used as woodland. This soil is suited to row crops. Crop rotation, minimum tillage, terracing, contour farming, returning crop residue to the soil, and vegetated waterways slow runoff and reduce erosion.

This soil is suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Proper stocking, controlled grazing, and weed and brush control help keep the soil in good condition.

This soil is suited to loblolly pine, shortleaf pine, and sweetgum. Limitations to woodland management are slight except for moderate plant competition.

This soil has good potential for use as habitat for openland and woodland wildlife and poor potential for wetland wildlife.

This soil has moderate limitations for community development. Wetness, low strength for streets and roads, and slope are limitations. Because of wetness and the moderately slow permeability in the fragipan, the soil has severe limitations for septic tank absorption fields.

This Ora soil is in capability subclass IIIe and in woodland suitability group 3o7.

OrD2—Ora loam, 8 to 12 percent slopes, eroded. This is a moderately well drained, strongly sloping soil that has a fragipan. It formed in loamy marine sediment on ridgetops on uplands.

Typically, the surface layer is strong brown loam about 4 inches thick. The subsoil extends to a depth of 60 inches or more. To a depth of 19 inches, it is yellowish red loam. Below that, it is a fragipan that is loam mottled in shades of red, brown, and gray.

In most places, the surface layer is mixed with subsoil because erosion has removed part of the original surface. In places, all of the original surface layer has been removed, and the plow layer is subsoil. In other places, the plow layer is mostly the original surface layer. Some fields have a few rills and shallow gullies on side slopes and in drainageways.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil but is moderately slow in the fragipan. During wet seasons, the high water table fluctuates between 2 and 3 1/2 feet below the surface or is perched above the fragipan. Available water capacity is medium. Runoff is medium, and erosion is a severe hazard. The depth to which roots penetrate and the movement of air and water through the soil are restricted by the fragipan.

Included in mapping are small areas of Ruston, Savannah, and Smithdale soils in similar positions to this Ora soil and a few areas of soils that have slopes steeper than 8 percent. The included soils make up about 10 to 15 percent of the map unit.

Most of the acreage is used for pasture and as woodland; some areas are used for crops. This soil is poorly suited to row crops because of the erosion hazard. Crop rotation, minimum tillage, terracing, contour farming, returning crop residue to the soil, and vegetated waterways reduce runoff and lessen erosion.

This soil is suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes some surface compaction by livestock and poor tilth. Proper stocking, controlled grazing, and weed and brush control help keep the soil in good condition.

This soil is suited to loblolly pine, shortleaf pine, and sweetgum. Limitations to woodland management are slight except for moderate plant competition.

This soil has good potential for use as habitat for openland and woodland wildlife and poor potential for habitat for wetland wildlife.

This soil has moderate limitations for most community development. Wetness, low strength for streets and roads, and slope are limitations. However, because of seasonal wetness and the moderately slow permeability of the fragipan layer, the soil has severe limitations for septic tank absorption fields.

This Ora soil is in capability subclass IVe and in woodland suitability group 3o7.

PaA—Paden silt loam, 0 to 2 percent slopes. This is a moderately well drained, nearly level soil that has a fragipan. This soil formed in a mantle of silty material over loamy material. It is on broad uplands and terraces.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil extends to a depth of 70 inches. To a depth of about 20 inches, it is yellowish brown silt loam that has brownish mottles. To a depth of 25 inches, it is silt loam mottled in shades of brown and gray. To a depth of 40 inches, it is a fragipan that is silt loam mottled in shades of brown and gray. Below about 40 inches, the subsoil is loam mottled in shades of brown and gray.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and slow in the fragipan. Late in winter, early in spring, and in prolonged wet seasons, a high water table fluctuates between 1 1/2 and 3 feet of the surface or is perched above the fragipan. Available water capacity is medium. Runoff is slow, and erosion is a slight hazard. Depth to which roots easily penetrate and the movement of air and water are restricted by the fragipan. Seedbed preparation

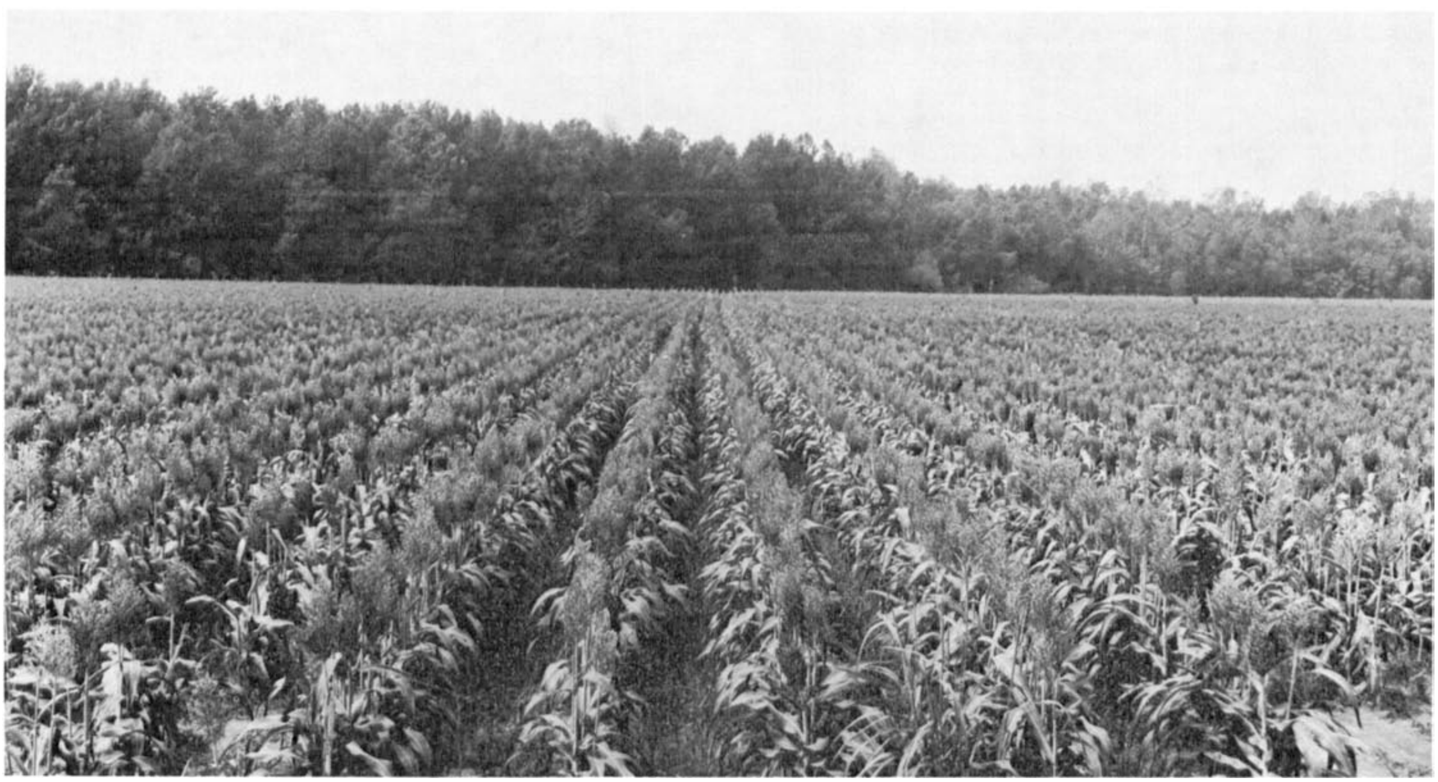


Figure 4.—Milo growing on Paden silt loam, 0 to 2 percent slopes.

and tillage are usually delayed in spring because of wetness.

Included in mapping are small areas of Ora soils on adjacent uplands and some areas of soils that have slopes slightly more than 2 percent and some areas of Guyton soils and other poorly drained soils in depressions and at the heads of drainageways. The included soils make up about 10 to 15 percent of this map unit.

Most of the acreage is used for pasture or row crops (fig. 4). This soil is well suited to row crops. Returning crop residue to the soil, minimum tillage, crop rotation, and diversion ditches control runoff and lessen erosion.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes some surface compaction by livestock and poor tilth. Proper stocking, controlled grazing, and weed and brush control reduce compaction and help maintain tilth.

This soil is suited to loblolly pine, shortleaf pine, and sweetgum. Woodland limitations are slight except for moderate plant competition.

This soil has good potential for use as habitat for openland and woodland wildlife and poor potential for wetland wildlife.

This soil has moderate limitations for community development. Wetness is the main hazard. Low strength is a severe limitation for streets and roads. The slow permeability of the fragipan and seasonal wetness are severe limitations of the soil for septic tank absorption fields.

This Paden soil is in capability subclass IIw and in woodland suitability group 3o7.

Pt—Pits. This miscellaneous area consists of gravel pits, sand pits, borrow pits, and rock quarries.

The gravel pits are in the eastern part of the county. The pits are open excavations from which gravel and sand have been removed. Depth to the gravel ranges from about 4 to 20 feet or more. Thickness of the gravel strata ranges from a few feet to more than 20 feet. The pits range up to 20 acres in size.

The sand pits are areas from which sand has been removed. These are mainly in the western part of the county in areas of Ruston and Smithdale soils. Borrow pits are areas from which soil and underlying materials have been removed for use in construction of roads and dams. Rock quarries are areas from which stones have been removed. These quarries are in the southeastern part of the county along Bear Creek. The stones are used for building material.

Many of these areas have been left bare and support only low quality grasses and trees. These areas are not suited to crops, pasture, woodland, and urban uses.

Pits are not assigned to a capability subclass or to a woodland suitability group.

Qu—Quitman fine sandy loam, 0 to 2 percent slopes. This is a somewhat poorly drained, nearly level soil. It formed in loamy material on stream terraces near flood plains.

Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsoil extends to a depth of 62 inches or more. To a depth of about 10 inches, it is pale brown fine sandy loam. To a depth of 22 inches, it is yellowish brown loam that has mottles in shades of brown and gray. The lower part of the subsoil is mottled in shades of brown and gray. To a depth of about 36 inches, it is slightly brittle and compact loam. Below that, it is slightly brittle and compact sandy loam.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. A high water table fluctuates between 1 1/2 and 2 feet below the surface or is perched above the compact layer in the winter and early in spring. Available water capacity is medium. Runoff is slow, and erosion is a slight hazard. Water movement through the soil is restricted by the slightly compact and brittle layer in the subsoil. Seasonal wetness delays seedbed preparation and tillage in most years.

Included in mapping are small areas of Guyton soils in depressions and drainageways and Savannah soils on gently sloping, slightly higher stream terraces. The included soils make up about 10 to 15 percent of the map unit.

Most of the acreage is used for pasture or row crops; some small acreage is used as woodland. This soil is well suited to row crops. In places, surface field ditches are needed to remove surface water.

This soil is well suited to growing grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes some surface compaction by livestock and poor tilth. Proper stocking, controlled grazing, and weed and brush control help keep the soil in good condition.

This soil is well suited to loblolly pine, sweetgum, and yellow-poplar. Wetness impedes the use of harvesting equipment late in winter and early in spring.

This soil has good potential for use as habitat for openland and woodland wildlife and poor potential for wetland wildlife habitat.

This soil has moderate limitations for most kinds of community development because of the seasonal high water table. Low strength is a limitation for streets and roads. The seasonal high water table and the moderately slow permeability of the subsoil are severe limitations of the soil for septic tank absorption fields.

This Quitman soil is in capability subclass IIw and in woodland suitability group 2w8.

Rs—Rock outcrop-Smithdale complex, 15 to 30 percent slopes. This complex consists of small areas of

Figure 5.—Restored early settler's cabin, in Tishomingo State Park on Rock outcrop-Smithdale complex, 15 to 30 percent slopes.

Rock outcrop and well drained, steep Smithdale soils. These soils are on the bluffs along the sides of Bear Creek in Tishomingo State Park (fig. 5). The areas of soils and the areas of Rock outcrop exist in such an intricate and intermingled pattern that mapping them separately is impractical at the scale of mapping used. Areas range from 5 to 40 acres.

Rock outcrop makes up about 60 percent of this unit and Smithdale soils about 36 percent. Other soils make up the remaining 4 percent.

The Rock outcrop, called Highland Church sandstone, is on uplands. Typically, the sandstone is at the surface; in places, there is a layer of soil, commonly less than 3 inches thick, above the sandstone.

The well drained Smithdale soil is on uplands. Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsurface layer, which extends to a depth of 10 inches, is yellowish brown sandy loam. The subsoil extends to a depth of 80 inches. The upper part of the subsoil is yellowish red sandy clay loam to a depth of 23 inches. The next layer, which extends to a depth of 44 inches, is yellowish red loam. Below that, to a depth of 80 inches, is yellowish red sandy loam.

Smithdale soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout. Permeability is moderate in the upper part of the subsoil and moderately rapid in the lower part. Available water capacity is medium. Runoff is rapid and erosion is a severe hazard. The seasonal high water table is more than 6 feet below the surface.

Included in the map unit are small areas of Ora and Saffell soils. These included soils are on the upper side slopes.

Most of this unit is in forest of hardwoods and pine. This unit is poorly suited to crops and pasture. The main limitations are the steep slopes and the rock outcrops. The best use of this unit is for woodland and recreation.

The soil is suited to loblolly and shortleaf pine. Limitations to woodland management are slight.

The soil has fair potential for use as habitat for openland wildlife and good potential for woodland wildlife habitat. Potential is very poor for wetland wildlife habitat.

This complex has severe limitations for community development and for septic tank absorption fields because of steep, rough slopes and the Rock outcrop.

Rock outcrop is not assigned to a capability subclass or to a woodland suitability group. Smithdale soil is in capability subclass VIIe and in woodland suitability group 3o1.

RuB2—Ruston sandy loam, 2 to 5 percent slopes, eroded. This is a well drained, gently sloping soil. It formed in loamy material on ridgetops on uplands.

Typically, the surface layer is yellowish brown sandy loam about 5 inches thick. The subsoil extends to a depth of 80 inches or more. To a depth of about 13 inches, it is yellowish red loam. To about 24 inches, it is yellowish red clay loam. To about 34 inches, it is red sandy clay loam containing pockets of pale brown uncoated sand grains. To about 68 inches, it is red sandy clay loam mottled with strong brown. Below this, it is red sandy loam mottled with strong brown.

In most places, the surface layer has been thinned by erosion. In some eroded places, the subsoil is mixed with the plow layer. In some places, the original surface layer is gone, and the plow layer is subsoil. Rills and shallow gullies are common along natural drainageways.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate. Available water capacity is medium. Runoff is slow to medium, and erosion is a moderate hazard. The seasonal high water table is more than 6 feet below the surface.

Included are small areas of Ora, Saffell, and Smithdale soils on uplands and also some areas of soils that have slopes of more than 5 percent. Also included are soils that have a silt loam surface. The included soils make up about 10 to 15 percent of the map unit.

Most of the acreage is used for pasture and row crops, but some areas are used as woodland. This soil is well suited to row crops. Returning crop residue to the soil, minimum tillage, crop rotation, contour farming, terracing, and vegetative waterways reduce runoff and erosion.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes some surface compaction by livestock and poor tilth. Proper stocking, controlled grazing, and weed and brush control help keep the soil in good condition.

This soil is well suited to peach orchards and vineyards. Planting on the contour and winter cover crops help to control erosion.

This soil has good potential for use as habitat for openland and woodland wildlife and has very poor potential for wetland wildlife habitat.

This soil is suited to loblolly pine and shortleaf pine. Limitations to woodland management are slight.

This soil has slight limitations for community development. Low strength is a moderate limitation for streets and roads. This soil has slight limitations for septic tank absorption fields.

This Ruston soil is in capability subclass IIe and in woodland suitability group 3o1.

RuC2—Ruston sandy loam, 5 to 8 percent slopes, eroded. This is a well drained, sloping soil. It formed in loamy material on ridgetops on uplands.

Typically, the surface layer is dark brown sandy loam about 5 inches thick. The subsoil extends to a depth of 70 inches or more. To a depth of about 13 inches, it is yellowish red loam. To a depth of about 34 inches, it is yellowish red sandy clay loam. To a depth of about 50 inches, it is red sandy loam mottled light yellowish brown. The lower part of the subsoil is red sandy clay loam.

In most places, the surface layer has been thinned by erosion. In some eroded places on slopes, the original surface is washed away, and the plow layer is subsoil. Rills and some shallow gullies are along natural drainageways.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate. Available water capacity is medium. Runoff is slow to medium, and erosion is a moderate hazard. The seasonal high water table is more than 6 feet below the surface.

Included in mapping are small areas of Ora, Saffell, and Smithdale soils in similar positions to this Ruston soil and some soils that have slope of more than 8 percent. The included soils make up about 10 to 15 percent of the map unit.

Most of the acreage is used for pasture and row crops. A smaller acreage is used as woodland.

This soil is suited to row crops. Returning crop residue to the soil, minimum tillage, crop rotation, contour farming, terracing, and vegetative waterways slow runoff and reduce erosion.

This soil is suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes some surface compaction by livestock and poor tilth. Proper stocking, controlled grazing, and weed and brush control help keep the soil in good condition.

This soil is suited to loblolly and shortleaf pine. Limitations to woodland management are slight.

This soil has good potential for use as habitat for openland and woodland wildlife and very poor potential for wetland wildlife habitat.

This soil has slight limitations for community development. Slope is a moderate limitation for small commercial buildings and industrial sites. Low strength is a limitation for streets and roads. Limitations of the soil for septic tank absorption fields are slight.

This Ruston soil is in capability subclass IIIe and in woodland suitability group 3o1.

SA—Saffell-Smithdale association, hilly. This map unit consists of steep, well drained soils that occur in a regular and repeating pattern in hilly upland areas. It is mainly in the northeastern portion of the county bordering Pickwick Lake. The unit is also along the eastern boundary of the county. The landscape is hilly with narrow ridgetops and steep side slopes that are dissected by numerous short drainageways. Outcrops of limestone are on the lower side slopes of hills bordering Pickwick Lake and along the shoreline of Pickwick Lake. Some creeks have rocky bottoms. The delineations are larger, more generalized, and more inclusive than the delineations of map units containing one soil type or phase. Smithdale soils are on ridgetops and the upper part of side slopes. Saffell soils are mostly on the middle and lower parts of side slopes. Smithdale soils formed in loamy material that has a high content of sand; Saffell soils formed in loamy material that has a high content of gravel. Slopes range from 12 to 40 percent. Areas of this association range from about 200 to more than 1,000 acres.

Saffell soils and closely related soils make up about 63 percent of the association. Typically, the surface layer is dark brown gravelly loam about 6 inches thick. The subsoil extends to a depth of 34 inches or more. To a depth of about 18 inches, it is yellowish red gravelly loam. The lower part of the subsoil is strong brown gravelly loam. The underlying material to a depth of 80 inches is gravelly sandy loam mottled in shades of red, brown, and gray.

Saffell soils are low in natural fertility. Reaction is very strongly acid or strongly acid. Available water capacity is low, and permeability is moderate. Runoff is rapid, and erosion is a severe hazard. The seasonal high water table is more than 6 feet below the surface.

Smithdale soils and closely related soils make up about 32 percent of the association. Typically, the surface layer is strong brown fine sandy loam about 4 inches thick. The subsoil extends to a depth of 85 inches or more. To a depth of about 14 inches, it is red loam. To a depth of 38 inches, it is red sandy clay loam. The lower part of the subsoil is red sandy loam.

Smithdale soils are low in natural fertility. Reaction is very strongly acid or strongly acid throughout. Available water capacity is medium. Permeability is moderate in the upper part of the subsoil and moderately rapid in the lower part. Runoff is rapid, and erosion is a severe hazard. The seasonal high water table is more than 6 feet below the surface.

Included in mapping, and making up about 5 percent of the association, are areas of Ruston and Ora soils on the ridgetops and upper side slopes. Also in the unit are small areas of Mantachie and Kirkville soils on narrow flood plains and in drainageways. In some places, mainly in the northeastern part of the county, cherty limestone escarpments are on the lower part of side slopes and border the creek channels.

Most of the acreage is used as woodland. These soils are poorly suited to row crops because of very steep slopes and the severe erosion hazard. Because of the low productivity of these soils, they are poorly suited to pasture grasses and legumes. Saffell soils are suited to trees, but the productivity potential is low. Smithdale soils are suited to loblolly and shortleaf pines. Low productivity of the Saffell soils is the main limitation to woodland use and management.

Saffell soils have poor potential for use as habitat for openland wildlife, and Smithdale soils have fair potential. For habitat for woodland wildlife, Saffell soils have fair potential, and Smithdale soils have good potential. For habitat for wetland wildlife, both Saffell and Smithdale soils have very poor potential.

These soils have severe limitations for community development and for septic tank absorption fields because of the steep slopes.

These Saffell and Smithdale soils are in capability subclass VIIe. Saffell soils are in woodland suitability group 4f2, and Smithdale soils are in woodland suitability group 3o1.

ShA—Savannah silt loam, 0 to 2 percent slopes. This is a moderately well drained, nearly level soil that has a fragipan. It formed in loamy material on terraces and ridgetops on uplands.

Typically, the surface layer is dark grayish brown silt loam about 10 inches thick. The subsoil extends to a depth of 65 inches or more. To a depth of about 24 inches, it is yellowish brown silt loam. The material below this is a fragipan of loam mottled in shades of brown and gray.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. A high water table fluctuates between 1 1/2 and 3 feet of the surface or is perched above the fragipan late in winter and early in spring. Available water capacity is medium. Runoff is slow, and erosion is a slight hazard. The fragipan restricts the depth to which roots easily penetrate and the movement of air and water through the soil. Seedbed preparation and tillage are slightly delayed in spring by seasonal wetness.

Included with this soil are small areas of Ora soils on uplands, areas of soils that have steeper slopes, and areas of Quitman soils in depressions and heads of drainageways. The included soils make up about 10 to 15 percent of this map unit.

Figure 6.—Improved pasture on Savannah silt loam, 0 to 2 percent slopes. In the background, Woodall Mountain, the highest point in Mississippi, rises to over 800 feet above sea level.

Most of the acreage is used for pasture (fig. 6) or row crops. This soil is well suited to row crops. Returning crop residue to the soil, minimum tillage, and crop rotation reduce runoff and lessen erosion. In places, surface field ditches help remove surface water.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing the pasture reduces plant cover and thereby causes excessive runoff and increases the erosion hazard. Proper stocking, controlled grazing, and weed and brush control help control erosion and slow runoff.

This soil is suited to loblolly pine, shortleaf pine, sweetgum, and southern red oak. The windthrow hazard and plant competition are the main limitations.

This soil has good potential for use as habitat for openland and woodland wildlife and very poor potential for use as habitat for wetland wildlife.

This soil has moderate limitations for community development because of a seasonal high water table. The moderately slow permeability in the fragipan and the seasonal wetness are severe limitations for septic tank absorption fields.

This Savannah soil is in capability subclass IIw and in woodland suitability group 3o7.

ShB2—Savannah silt loam, 2 to 5 percent slopes, eroded. This is a moderately well drained, gently sloping soil that has a fragipan. It formed in loamy material on terraces, and ridgetops in uplands.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. To a depth of about 20 inches, it is yellowish brown silt loam. Below that, it is a fragipan mottled in shades of brown, gray, and red. The fragipan is loam to a depth of about 36 inches and sandy clay loam below.

In most places, the surface layer has been thinned by erosion. In some places, the surface layer is gone and the plow layer consists of subsoil. Some fields have rills and a few shallow gullies extending into the fragipan.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout. Permeability is moderate above the fragipan and moderately slow in the fragipan. A high water table fluctuates between 1 1/2 and 3 feet below the surface or is perched above the fragipan late in winter and early in spring. Available water capacity is medium. Runoff is medium to slow, and erosion is a moderate hazard. The fragipan restricts the depth to which plant roots easily penetrate and the movement of air through the soil.

Included in mapping are small areas on uplands where the slope is more than 5 percent. Also included in mapping are small areas of Ora soils on knolls and side slopes. The included soils make up about 10 to 15 percent of the map unit.

Most of the acreage is used for pasture or row crops (fig. 7). Some acreage is used as woodland. The soil is well suited to row crops. Returning crop residue to the soil, minimum tillage, crop rotation, contour farming, terracing, and vegetative waterways slow runoff and reduce the erosion hazard. Erosion of the surface layer reduces the depth of the soil to the fragipan and significantly lowers yields.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing the pasture reduces plant cover and thereby causes excessive runoff and increases the erosion hazard. Proper stocking, controlled grazing, and weed and brush control help control erosion and slow runoff.

This soil is suited to loblolly pine, shortleaf pine, sweetgum, and southern red oak. Windthrow hazard and plant competition are the main limitations to the use of this soil as woodland.

This soil has good potential for use as habitat for openland and woodland wildlife and very poor potential for use as habitat for wetland wildlife.

This soil has moderate limitations for community development because of a seasonal high water table. However, the moderately slow permeability in the fragipan layer and the seasonal wetness are severe limitations for septic tank absorption fields.

This Savannah soil is in capability subclass IIe and in woodland suitability group 3o7.

SmD—Smithdale sandy loam, 8 to 15 percent slopes. This is a well drained, strongly sloping to moderately steep soil. It formed in loamy material high in sand content on side slopes on uplands.

Typically, the surface layer is brown sandy loam about 6 inches thick. The subsoil extends to a depth of 80 inches or more. It is yellowish red loam to a depth of about 46 inches and yellowish red sandy loam to a depth of about 65 inches. Below that, it is red sandy loam that has pockets of uncoated sand grains.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately rapid in the lower part. Available water capacity is medium. Runoff is rapid, and erosion is a severe hazard. The seasonal high water table is more than 6 feet below the surface.

Included with this soil in mapping are small areas of Ora and Ruston soils on ridgetops and small areas of Kirkville and Mantachie soils in narrow drainageways.

Figure 7.—Soybeans on Savannah silt loam, 2 to 5 percent slopes, eroded, yielded 50 bushels an acre in 1979. Contour farming, terraces, and grassed waterways help reduce erosion on this soil.

The included soils make up about 15 to 20 percent of the map unit.

Most of the acreage is used as woodland. This soil is poorly suited to row crops. If this soil is cultivated, erosion is a severe hazard.

This soil is suited to loblolly pine and shortleaf pine. Many areas contain mixed hardwoods and pines, but pines have been planted on large acreages. Water bars constructed on all roads help prevent gully formation. When logging is completed, roads should be seeded to grass to prevent erosion.

This soil is suited to pasture, but erosion is a severe hazard. Animal trails can form gullies. Management includes controlled grazing and fertilizer.

This soil has good potential for use as habitat for openland and woodland wildlife and very poor potential for use as habitat for wetland wildlife.

This soil has a moderate limitation for community development because of slope. However, for small commercial buildings, the limitation is severe. The steep slopes moderately limit this soil for septic tank absorption fields.

This Smithdale soil is in capability subclass VIe and in woodland suitability group 3o1.

SmE—Smithdale sandy loam, 15 to 30 percent slopes. This is a well drained, steep soil on side slopes on uplands. It formed in loamy material that is high in sand content.

Typically, the surface layer is yellowish brown sandy loam about 6 inches thick. The subsoil extends to a depth of 85 inches or more. It is yellowish red loam to a depth of about 12 inches. To a depth of about 51 inches, it is red loam. Below that, it is a red sandy loam that has pockets of uncoated sand grains.

This soil is low in natural fertility. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately rapid in the lower part. Available water capacity is medium. Runoff is rapid, and erosion is a severe hazard. The seasonal high water table is more than 6 feet below the surface.

Included in mapping are small areas of Ora and Ruston soils on ridgetops and Mantachie soils in narrow drainageways.

Most of the acreage is used as woodland. This soil is poorly suited to row crops and pasture because of steepness of slopes and the severe erosion hazard.

This soil is suited to loblolly and shortleaf pine. Plant competition is a moderate limitation. Erosion is a severe hazard on logging roads and trails. Constructing water bars and reestablishing vegetation following any logging operation are needed to stabilize logging roads and trails.

This soil has fair potential for use as habitat for openland wildlife and good potential for use as habitat for woodland wildlife. For wetland wildlife habitat, potential is very poor.

This soil has severe limitations for community development and for septic tank absorption fields because of the steep slopes.

Smithdale soils are in capability subclass VIIe and in woodland suitability group 3o1.

SR—Smithdale-Ruston association, hilly. This map unit consists of the steep, well drained Smithdale and Ruston soils in a regular and repeating pattern in ruggedly dissected hilly uplands. The composition varies somewhat among mapped areas, but mapping has been controlled well enough for the expected use of the soils. Smithdale soils are on the side slopes. Ruston soils are on ridgetops and the upper part of side slopes. Slopes range from 5 to 40 percent.

Smithdale soils and closely similar soils make up about 50 percent of the association. Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil extends to a depth of 80 inches or more. It is yellowish red sandy clay loam to a depth of about 43 inches. Below that, it is yellowish red sandy loam.

Smithdale soils are low in natural fertility. Reaction is very strongly acid or strongly acid throughout. Permeability is moderate in the upper part of the subsoil and moderately rapid in the lower part. Available water capacity is medium. Runoff is rapid, and erosion is a severe hazard. The seasonal high water table is more than 6 feet below the surface.

Ruston soils and closely similar soils make up about 35 percent of the association. Typically, the surface layer is grayish brown sandy loam about 6 inches thick. The subsoil extends to a depth of 85 inches or more. The upper part of the subsoil is yellowish red loam to a depth of about 22 inches. From a depth of about 22 to 37 inches, it is yellowish red sandy loam that has yellowish brown and pale brown mottles. The lower part is red sandy clay loam that has yellowish brown mottles.

Ruston soils are low in natural fertility. Reaction is very strongly acid or strongly acid throughout. Permeability is moderate, and available water capacity is medium. Runoff is rapid, and erosion is a severe hazard. The seasonal high water table is more than 6 feet below the surface.

Included in mapping, and making up about 15 percent of the association, are small areas of Ora, Saffell, and Savannah soils on the ridgetops and small areas of Kirkville and Mantachie soils on narrow flood plains.

Most of the acreage is used as woodland. Because of the steep slopes, rapid runoff, and severe erosion hazard, these soils are poorly suited to crops and pasture. Permanent vegetation should be maintained on these soils to control erosion.

Both the Smithdale and Ruston soils are suited to loblolly pine and shortleaf pine. Limitations to woodland management are slight, except for moderate plant competition and the high susceptibility of logging roads and trails to form gullies.

Smithdale soils have fair potential for use as habitat for openland wildlife, and Ruston soils have good potential. Both Smithdale and Ruston soils have good potential for habitat for woodland wildlife and very poor potential for habitat for wetland wildlife.

Soils on ridgetops that have slope of less than 15 percent have slight or moderate limitations for most kinds of community development including septic tank absorption fields. Soils that have slope of more than 15 percent are severely limited for all community development and septic tank absorption fields.

These Smithdale and Ruston soils are in capability subclass VIIe and in woodland suitability group 3o1.

UD—Udorthents, loamy, nearly level. These are nearly level, well drained soils that formed in graded and smoothed spoil material consisting of soil and the underlying regolith. These soils are along the Tennessee-Tombigbee Waterway. The spoil material was removed from excavations for the waterways, which is as much as 175 feet deep and 300 feet wide.

These soils have been mixed during movement and reworking and have no definite horizonation. They do not have an orderly sequence of layers but are a variable mixture of loamy, sandy, clayey, and gravelly material. The loamy and sandy material includes glauconitic, micaceous, and ferruginous sands. The clayey material includes varying amounts of lignite. Coarse fragments consist of chert and quartzite gravel and cobbles and angular and platy ironstone fragments.

Included in mapping are small areas where the thickness of the fill material is less than 2 feet, and other areas where it is greater than 6 feet. Also included are small areas of poorly drained loamy soils where the water table is near the surface in wet seasons.

These soils are low in natural fertility and in organic matter content. Reaction ranges mostly from extremely acid to strongly acid; pockets of calcareous material are present. Permeability is moderately slow, and the available water capacity is medium. Runoff is slow, and erosion is a moderate hazard. The seasonal high water table is more than 5 feet below the surface.

Many areas of Udorthents were made recently and are still barren and devoid of plant life. Some areas are seeded to grasses and legumes. Native plants are slowly established either by seeds that have blown in by wind or dropped by birds. This soil is well suited to loblolly pine.

These soils have good potential for use as habitat for openland wildlife and very poor potential for use as habitat for wetland wildlife. They are not rated for woodland wildlife habitat.

The limitations of these soils for community development and septic tank absorption fields range from slight to severe because of the variable soil materials. Onsite investigation is needed.

Udorthents are not assigned to a capability subclass or to a woodland suitability group.

prime farmland

Prime farmland is one of several kinds of important farmlands defined by the U.S. Department of Agriculture. It is of major importance in providing the Nation's short- and long-range needs for food and fiber. The supply of high quality farmland is limited and the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, must encourage and facilitate the use of our Nation's prime farmland with wisdom and foresight.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops when it is treated and managed using acceptable farming methods. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland is either used for producing food or fiber or is available for this use. Urban or built-up land or water areas are not included. Urban and built-up land includes any unit of land of 10 acres or more that is used for residences, industrial sites, commercial sites, construction sites, institutional sites, public administrative sites, railroad yards, small parks, cemeteries, airports, golf courses, spillways, shooting ranges, and so forth.

Prime farmland usually has an adequate and dependable supply of moisture from precipitation. It also has favorable temperature and growing season, acceptable acidity or alkalinity. It has few or no rocks and is permeable to water and air. Prime farmland is not excessively erodible or saturated with water for long periods and is not flooded during the growing season. The slopes range mainly from 0 to 5 percent. For more detailed information on the criteria for prime farmland, consult the local staff of the Soil Conservation Service.

About 51,000 acres, or about 18 percent, of Tishomingo County meets the soil requirements for prime farmland. Areas are scattered throughout the county with much of it in map units 1, 2, and 3 of the general soil map. Approximately 22,000 acres of this prime farmland is used for crops. Crops grown on this land, mainly corn and soybeans, account for much of county's total agricultural income each year.

A recent trend of land use to industrial and urban uses in some parts of the county has caused the loss of some prime farmlands. The loss of prime farmland to uses other than farming puts pressure on marginal lands, which generally are more erodible, droughty, and difficult to cultivate, and are usually less productive.

Soil map units that make up prime farmland in Tishomingo County are listed in this section. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on detailed soil maps in the back of this publication. The soil qualities that affect use and management are described in the section "Detailed soil map units."

Soils that have limitations, such as a high water table, may qualify for prime farmland if these limitations are overcome by such measures as drainage. In the following list, these measures are shown in parentheses after the map unit name. Onsite evaluation is necessary to see if these limitations have been overcome by corrective measures.

The soil map units in the following list meet the soil requirements for prime farmland except where the use is urban or built-up land.

Gu—Guyton silt loam (where drained)
Je—Jena silt loam
Kr—Kirkville loam
Ma—Mantachie loam
OrB2—Ora loam, 2 to 5 percent slopes, eroded
PaA—Paden silt loam, 0 to 2 percent slopes
Qu—Quitman fine sandy loam, 0 to 2 percent slopes
RuB2—Ruston sandy loam, 2 to 5 percent slopes, eroded
ShA—Savannah silt loam, 0 to 2 percent slopes
ShB2—Savannah silt loam, 2 to 5 percent slopes, eroded

use and management of the soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

crops and pasture

Thomas E. Main, Jr., soil conservationist, Soil Conservation Service, helped prepare this section.

The major management concerns in the use of the soils for crops and pasture are described in this section. In addition, the crops or pasture plants best suited to the soil, including some not commonly grown in the survey area, are discussed; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are presented for each soil.

This section provides information about the overall agricultural potential of the survey area and about the management practices that are needed. The information is useful to equipment dealers, land improvement contractors, fertilizer companies, processing companies, planners, conservationists, and others. For each kind of soil, information about management is presented in the section "Detailed soil map units." Planners of management systems for individual fields or farms should also consider the detailed information given in that section.

More than 44,050 acres in the survey area was used for crops and pasture, according to the 1974 Census of Agriculture. Of this total, 21,800 acres was used for permanent pasture. The acreage of crops consisted of 18,150 acres of row crops; 600 acres of close-growing crops, mainly wheat and oats; and 3,500 acres of miscellaneous crops.

The potential of the soils in Tishomingo County for increased production of food and fiber is good. Many acres of potentially good cropland (capability subclasses IIe, IIw, and IIIw) are currently used as woodland and pasture. In addition to the reserve productive capacity represented by this acreage, production could be increased considerably by extending the latest crop production technology to all cropland in the county. This soil survey can greatly facilitate the application of such technology.

The acreage in crops, mainly soybeans, has increased in the last several years, and the acreage in pasture has remained stable. The use of this survey to help make land use decisions that will influence the future role of farming is discussed in the section "General soil map units."

Erosion is the major soil problem on more than two-thirds of the land in Tishomingo County. Where the slope is more than 2 percent, erosion is a hazard. Ora and Ruston soils and most of the acreage of Savannah soils, for example, have slopes of 2 to 5 percent.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils with a layer in or below the subsoil that limits the depth of the root zone and reduces total available water capacity. Such layers include fragipans, as in Ora and Savannah soils. Erosion also reduces productivity on soils that are droughty, such as the Smithdale soils. Second, erosion results in sediment entering streams. Control of erosion minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation, and for fish and wildlife.

In many sloping fields, preparing a good seedbed and tilling are difficult on spots where the fragipan is exposed because the soil material above the pan has been eroded. Such spots are common in areas of Ora and Savannah soils.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps vegetative cover on the soil for extended periods can hold soil erosion losses to amounts that will not reduce the productive capacity of the soil. On livestock farms, which require pasture and hay, the legume and grass forage crops in the cropping system reduce erosion on sloping land and also provide nitrogen and improve tilth for the next crop.

Cropping systems that provide substantial vegetative cover are needed to control erosion on sloping soils unless minimum tillage is practiced. Minimizing tillage and leaving crop residue on the surface help to increase infiltration and reduce the hazard of runoff and erosion. These practices can be adapted to most soils in the survey area but are most difficult to use successfully on the eroded soils. No-till for soybeans is effective in reducing erosion on sloping land and can be adapted to most soils in the survey area.

Terraces and diversions reduce the length of slope and reduce runoff and erosion. They are most practical on deep, well drained soils that have regular slopes. Ruston soils are generally suitable for terraces and diversions.

Contouring and contour stripcropping can be used in most places. They are best adapted to soils with smooth, uniform slopes, including most areas of the Ora and Savannah soils.

Information on the design of erosion control practices for each kind of soil is available at the local office of the Soil Conservation Service.

Soil drainage is the major management need on much of the acreage used for crops and pasture in the county. Most of the soils on flood plains need artificial drainage to achieve maximum production. In this category are Jena, Kirkville, and Mantachie soils. These soils account for about 33,900 acres in Tishomingo County.

Guyton, Paden, and Quitman soils and nearly level areas of Savannah soils are on uplands or terraces in broad flat areas. They need artificial drainage to achieve maximum production.

The design of drainage systems varies with the kind of soil, the slope, the size of the area to be drained, and the vegetation. Information on drainage design for each soil is available at the local office of the Soil Conservation Service.

Soil fertility is naturally low in most of the soils on uplands in the survey area. All soils in the county are naturally acid. The soils on flood plains, such as the Jena and Mantachie soils, are very strongly acid or strongly acid and are naturally higher in plant nutrients than most upland soils.

Many of the soils on uplands are naturally very strongly acid. Applications of ground limestone are generally needed to raise the pH level sufficiently for good growth of crops and pasture. Available phosphorus and potash levels are naturally low in most of these soils. On all the soils, additions of lime and fertilizer should be based on results of soil tests, on the need of the crop, and on the expected level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to apply.

Soil tilth is an important factor in the germination of seed and in the infiltration of water into the soil. Soils with good tilth are granular and porous.

Most of the soils used for crops in the county have a silt loam, loam, or sandy loam surface layer that is light in color and generally low in content of organic matter. Generally the structure of such soils is weak, and intense rainfall causes the formation of a crust on the surface. When the soil is dry the crust is hard and is nearly impervious to water. Once the crust forms, it reduces infiltration and increases runoff. Regular additions of crop residue, manure, and other organic material can help to improve soil structure and reduce crusting.

Fall plowing is generally not a good practice on the light colored soils because they erode easily. Some fall plowing, however, is done in the southern part of the county.

Field crops suited to the soils and climate of the county include many that are not commonly grown. Cotton, corn, and soybeans are the main row crops. Alfalfa, sorghum, millet, cowpeas, field beans, peanuts, potatoes, and other crops can be grown if economic conditions are favorable.

Wheat and oats are common close-growing crops. Rye and barley can be grown, and grass seed can be produced from fescue and bahiagrass.

The row crops are best suited to the Jena, Kirkville, and Mantachie soils that are on flood plains and to the nearly level to sloping Guyton, Ora, Paden, Quitman, Ruston, and Savannah soils on uplands. Close-growing crops are suited to these soils and, in addition, can be grown on steeper areas of these and other soils.

Deep soils that have good natural drainage and that warm early in spring are especially suited to many vegetables. Fruits such as peaches, pears, and apples are best suited to the deep, well drained Ruston and Smithdale soils, except on steeper areas that are more susceptible to erosion.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed soil map units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, animal manure, and green-manure crops; and harvesting that insures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils.

land capability classification

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

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

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

Class I soils have slight limitations that restrict their use. No Class I soils are recognized in Tishomingo County.

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

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

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

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use. No Class V soils are recognized in Tishomingo County.

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

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

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production. No Class VIII soils are recognized in Tishomingo County.

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

The acreage of soils in each capability class and subclass is shown in table 6. The capability classification of each map unit is given in the section "Detailed soil map units."

woodland management and productivity

Joseph V. Zary, forester, Soil Conservation Service, helped prepare this section.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low.

The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *w* indicates excessive water in or on the soil; the letter *f*, high content of coarse fragments in the soil profile; and the letter *o*, that limitations or restrictions are insignificant.

The third part of the symbol, a number indicates the kind of trees for which the soils in a group are best suited, and also the severity of the limitation. The numbers 1, 2, and 3 indicate slight, moderate, and severe limitations, respectively, and suitability for needleleaf trees; 4, 5, and 6, slight, moderate, and severe limitations, respectively, and suitability for broadleaf trees; and 7, 8, and 9, slight, moderate, and severe limitations, respectively, and suitability for both needleleaf and broadleaf trees.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that a few trees may be blown down by normal winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

Ratings of *plant competition* indicate the degree to which undesirable plants are expected to invade where there are openings in the tree canopy. The invading plants compete with native plants or planted seedlings. A rating of *slight* indicates little or no competition from other plants; *moderate* indicates that plant competition is expected to hinder the development of a fully stocked stand of desirable trees; *severe* indicates that plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed to control undesirable plants.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. Site index was determined at age 30 years for eastern cottonwood, 35 years for American sycamore, and 50 years for all other species. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

woodland resources

About 191,400 acres, or about 68 percent, of Tishomingo County is classified as commercial forest (*21*). Commercial forest land is land that is producing or is capable of producing crops of industrial wood and that has not been withdrawn from timber use (*14*). Commercial forest is divided into classes of ownership as follows: about 139,900 acres is owned by miscellaneous private owners; 26,400 acres is owned by forest industry; 20,300 acres is owned by farmers; and 4,800 acres is in public ownership (*21*).

Commercial forest may be subdivided into forest types. Types may be based on tree species, site quality, or age (*9, 13*). In this report, forest types are stands of trees of similar character, composed of the same general species, and growing under the same ecological and biological conditions. Forest types are named for the dominant tree species or the most abundant species.

- The loblolly-shortleaf pine forest is most important. In this forest, 50 percent or more of the stand is southern yellow pine and either loblolly or shortleaf pine or both. Associated trees include oak, hickory, and gum. In 1977, the loblolly-shortleaf pine forest occupied about 66,000 acres of the county (*6, 21*).
- The oak-hickory forest is second in importance. In this forest, 50 percent or more of the stand is either upland oaks or hickory or both. Associated trees include

yellow-poplar, elms, maple, and black walnut. In 1977, the oak-hickory forest occupied about 59,400 acres of the county (*6, 21*).

•The oak-pine forest ranks third in importance. In this forest, 50 percent or more of the stand is hardwoods, generally upland oaks, and southern pines make up 25 to 49 percent of the stand. Associated trees include sweetgum, blackgum, hickory, and yellow-poplar. In 1977, the oak-pine forest occupied about 39,600 acres of the county (*6, 21*).

•The oak-gum-cypress forest is fourth in importance. In this bottom land forest, 50 percent or more of the stand is tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination. Associated trees include cottonwood, willow, ash, elm, hackberry, and maple. In 1977, the oak-gum-cypress forest occupied about 26,400 acres of the county (*6, 21*).

During the 1960's and 1970's, much of the bottom land forest of Tishomingo County was converted to cropland and pasture. More recently the Tennessee-Tombigbee Waterway project has claimed additional bottom land acreage in the flood plains of Mackeys and Yellow Creeks. The remaining acreage of the oak-gum-cypress forest is located on the flood plains of these creeks as well as Bear Creek in the southeastern part and Chambers Creek in the northwestern part of the county.

The loblolly-shortleaf pine, oak-hickory, and oak-pine forest types generally are on lower slopes to upper slopes and ridges throughout the county. The oak-hickory forest and the oaks of the oak-pine forest are on uplands.

In terms of cubic feet of growing stock, board feet of sawtimber, distribution, and acreages in woodland, individual species rate (large to small) in the following order: loblolly pine; shortleaf pine; tupelo and blackgum; white oak; red oak; hickory; sweetgum; sweetbay and magnolia; beech, red maple, sycamore, and elm; and yellow-poplar and sugarberry (*11, 15, 17*).

In 1977, the woodlands of Tishomingo County supported a total of 403.1 million board feet of sawtimber. Of this total, 192.8 million board feet was softwood, mostly pine, and 210.3 million board feet was hardwood (*21*). The hardwood component included 81.1 million board feet of oak, 49.4 million board feet of gum, and 79.8 million board feet of other hardwoods.

In 1977, growing stock of all species totaled 169.8 million cubic feet. Of this total, 83.1 million cubic feet was softwood, mostly pine, and 86.7 million cubic feet was hardwood. The hardwood volume included 43.4 million cubic feet of oak, 17.0 million cubic feet of gum, and 26.3 million cubic feet of other hardwoods (*21*).

In 1977, the county's woodlands supported a total of 2,402,000 cords of growing stock, all species included. This volume included 1,108,000 cords of softwood, mostly pine, and 1,294,000 cords of hardwood. The hardwood volume included 647,000 cords of oak, 254,000 cords of gum, and 393,000 cords of other hardwoods.

In 1976, 8,394,000 board feet of saw-logs were produced in Tishomingo County. This volume included 5,000,000 board feet of softwood (pine) and 3,394,000 board feet of hardwood (*19*). During the same year, 43,577 standard cords of round pulpwood were produced on the commercial forest land of the county. Of this volume, 30,484 standard cords were softwood (pine) and 13,093 standard cords were hardwood (*19*). In 1977, Tishomingo County produced 30,314 standard cords of pulpwood (*20*). Of this volume, 24,164 cords were softwood (pine) and 6,150 cords were hardwood.

economic, social, and environmental benefits

The commercial forests in the county help to support a substantial timber economy in northeastern Mississippi and several wood-using industries within the county. The protection, management, and harvest and logging operations in the forest, together with the processing, transporting, and merchandising of wood products, provide employment for several hundred people (*19*).

Five small sawmills were operating in Tishomingo County in 1980. A small sawmill has an annual output of less than 3 million board feet. These sawmills are portable and have circular headsaws. The mills purchase pine and hardwood stumpage as well as short-length and tree-length logs. They produce small timbers and common boards, unfinished (*8, 11*).

The wood industries in the county in 1980 also included four pulpwood dealers and two plants that manufacture pallets, using upland hardwoods such as oak and hickory.

About 26 logging operators were in the county in 1980. These crews operate on either an annual or part-time basis. Most of these operators handle both pine and hardwood species, in short-length logs, or in tree-lengths or in both forms (*11*).

Forests produce other benefits. For example, trees can be planted to screen views of dumps and other unsightly areas, muffle the sound of traffic, reduce the velocity of winds, and lend beauty to the landscape.

woodland understory vegetation

David W. Sanders, range conservationist, Soil Conservation Service, helped prepare this section.

Understory vegetation consists of grasses, forbs, shrubs, and other plants. Some woodland, if well managed, can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the trees.

The quantity and quality of understory vegetation vary with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, and the depth and condition of the litter. The density of the canopy determines the amount of light that understory plants receive.

Significant changes in kinds and abundance of plants occur as the canopy changes, often regardless of grazing use. For these reasons, the forage value rating of grazable woodland is *not* an ecological evaluation of the understory.

Forage value ratings are based on the percentage of the understory made up of plants preferred by livestock.

Table 8 shows, for each soil suitable for woodland use, the potential for producing understory vegetation. The total production of understory vegetation includes the herbaceous plants and the leaves, twigs, and fruit of woody plants up to a height of 4 1/2 feet. It is expressed in pounds per acre of air-dry vegetation in favorable, normal, and unfavorable years. In a favorable year, soil moisture is above average during the optimum part of the growing season; in a normal year, soil moisture is average; and in an unfavorable year, it is below average.

Table 8 also lists the common names of the characteristic vegetation on each soil and the percentage composition, by air-dry weight of each kind of plant. The table shows the kind and percentage of understory plants expected under a canopy density that is most nearly typical of woodland in which the production of wood crops is highest.

recreation

E. E. Dorrill, III, landscape architect, Soil Conservation Service, helped prepare this section.

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its visual quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking, horseback riding, and bicycling should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

wildlife habitat

Harvey G. Huffstatler, wildlife biologist, Soil Conservation Service, helped prepare this section.

The wide variety of habitat in Tishomingo County supports all species of game animals and many nongame species of wildlife native to Mississippi. Common game species include deer, turkey, gray and fox squirrels, rabbit, quail, dove, woodchuck, and migratory waterfowl. Nongame species include songbirds, small rodents, reptiles, and amphibians. Furbearing animals, such as muskrat, beaver, mink, and raccoons, are common in the wetlands.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning wildlife management areas, refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results generally can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

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

Grain and seed crops are domestic grains and seed-producing annual herbaceous plants used by wildlife. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, sorghum, wheat, oats, and soybeans.

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

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds, that provide food and cover for wildlife. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are paspalum, panic grass, partridge pea, beggarweed, and pokeberry.

Hardwood trees and associated understory plants produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and understory plants are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, hawthorn, dogwood, hickory, blackberry, greenbrier, and honeysuckle. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn-olive, sawtooth oak, Chinese chestnut, and crabapple.

Coniferous plants furnish food and cover. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are loblolly pine, shortleaf pine, and eastern redcedar.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are hollies, huckleberry, American beautyberry, and hydrangea.

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

Shallow water areas have an average depth of less than 5 feet and are areas useful to wildlife. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are beaver ponds, constructed waterfowl feeding areas, farm ponds, and bottom land flood plains that have natural vegetation.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, and meadows. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, mourning doves, hawks, meadowlark, field sparrow, cottontail rabbits, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, songbirds, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of marshy shallow water areas and bottom land flood plains. Some of the wildlife attracted to such areas are waterfowl, wading birds, muskrat, mink, beaver, and river otter.

engineering

Jimmy R. Crouch, agricultural engineer, Soil Conservation Service, helped prepare this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

building site development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

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

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

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

sanitary facilities

Table 12 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to effectively filter the effluent. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope and bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

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

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

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

construction materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

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

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They may be wet, and the depth to the water table may be less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

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

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

water management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, terraces and diversions, and grassed waterways.

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

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

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

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

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect their maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

soil properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

engineering index properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains particles coarser than sand, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

physical and chemical properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 16, the estimated content of organic matter of the plow layer is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

soil and water features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt and water in swamps and marshes are not considered flooding.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. Only saturated zones within a depth of about 6 feet are indicated. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

physical and chemical analyses of selected soils

D. E. Pettry, agronomist, Department of Agronomy, Mississippi Agricultural and Forestry Experiment Station, Mississippi State University, helped prepare this section.

The soil analyses reported in table 18 and table 19 were made in the Soil Genesis and Morphology Laboratory of the Mississippi Agricultural and Forestry Experiment Station. Standard methods were used to analyze the soils (*16*). Representative soil samples were collected from pedons at different locations in Tishomingo County. Samples were prepared for analysis by air-drying, carefully crushing, and screening through a standard 20-mesh sieve.

The particle-size analyses shown in table 18 were obtained using Day's hydrometer method. Soil reaction (pH) shown in table 19 was determined with a Coleman pH meter using a glass electrode and a 1:1 ratio of soil and water. Exchangeable bases were extracted with neutral-normal ammonium acetate. Calcium, magnesium, potassium, and sodium were determined with a Perkin-Elmer atomic absorption instrument using strontium chloride to suppress interference. Extractable acidity (hydrogen plus aluminum) was extracted with barium chloride-triethanolamine solution buffered to pH 8.2 and was determined by back titration with hydrochloric acid. All results are expressed on the basis of oven-dry weight at 110 degrees Celsius.

Base saturation shown in table 19 was calculated by dividing the sum of the bases (calcium, magnesium, potassium, and sodium) by the sum of the cations and multiplying by 100. The sum of the cations includes the exchangeable bases and the extractable acidity (hydrogen plus aluminum). The sum of cations represents the cation exchange capacity of the soil, which is a measure of the ability to retain and exchange cations.

The physical properties of soils, such as water infiltration and conduction, shrink-swell potential, crusting, ease of tillage, and available water capacity, are closely related to soil texture (the percentage of sand, silt, and clay).

Soils with higher silt content in the surface layer, such as Paden and Savannah soils, pack if cultivated. In intensively cultivated areas, a surface crust that may hinder plant emergence forms on these soils.

The deep, loamy soils on ridgetops and side slopes of ridges, such as the Ruston, Saffell, and Smithdale soils, have relatively high sand content. The coarse-textured surface layers enhance rapid water infiltration and are droughty. The Saffell soils have a higher gravel content; the gravel content affects available water capacity.

Most of the soils in Tishomingo County have loamy textures and generally do not contain layers that are high in clay content within a depth of 4 feet. Expansive montmorillonitic clay layers are not generally present in the upper 4 feet of the soils in the county.

The chemical properties of soils and other soil features, such as permeability, structure, texture, and consistence, influence the limitations and potentials of any soil. Chemical properties are not evident in visual observations of a soil; laboratory analyses are necessary. The amount and type of clay minerals present and the organic matter content largely control the chemical nature of soils. These substances have the capacity to attract and hold cations. Cations are elements that have a positive charge and that are bonded to clay minerals and organic matter that have a negative charge.

The exchangeable cations may be removed or exchanged through leaching or plant uptake. Through cation exchange, soil acidity can be corrected by liming. Neutralizing 1 milliequivalent per 100 grams of extractable acidity (hydrogen plus aluminum) requires application of 1,000 pounds of calcium carbonate (lime) per acre.

Soil chemical data are expressed as milliequivalents (meq) per 100 grams of dry soil. To use this data, convert milliequivalents per 100 grams of the various cations to pounds per acre for the plow layer. The plow layer, or topsoil, of average soils to a depth of 6.67 inches weighs about 2 million pounds per acre. The conversions for the cations listed in table 19 are as follows:

Calcium (Ca) meq/100 grams x 400 = pounds per acre
Magnesium (Mg) meq/100 grams x 240 = pounds per acre
Potassium (K) meq/100 grams x 780 = pounds per acre
Sodium (Na) meq/100 grams x 460 = pounds per acre

Many of the soils in Tishomingo County are acid and have a relatively low capacity to retain plant nutrients (cations) because of the influence of siliceous parent materials. Deep, well drained loamy soils, such as Ruston and Smithdale soils, on higher positions are very strongly acid or strongly acid and have a relatively low capacity to retain plant nutrients. However, crops grown on these soils respond to fertilizer.

Base saturation is related to weathering and reflects the replacement of bases by hydrogen. The Guyton soils on level, silty stream terraces have high sodium levels and base saturation values in the subsoil. Other soils on stream terraces, such as Quitman soils, have lower base saturation levels in the subsoil and a low sodium content.

The Soil Taxonomy classification system used in the National Cooperative Soil Survey uses chemical soil properties to differentiate some categories. The Alfisol and Ultisol orders, which are classes in the highest category in the system, are separated on the basis of the percentage of base saturation deep in the subsoil. Ultisols have base saturation of less than 35 percent in the lower part of the soil, whereas Alfisols have base saturation values greater than 35 percent.

classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*18*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 20, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Fluvaquents (*Fluv*, meaning flood plain, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. An example is Aeric Fluvaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, siliceous, acid, thermic Aeric Fluvaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

The Mantachie series is an example of fine-loamy, siliceous, acid, thermic Aeric Fluvaquents.

soil series and their morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (*12*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*18*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed soil map units."

Guyton series

The Guyton series consists of poorly drained, nearly level soils that formed in loamy sediments on uplands and terraces. Slopes range from 0 to 1 percent. The soils of the Guyton series are fine-silty, siliceous, thermic Typic Glossaqualfs.

Guyton soils are associated with Paden and Quitman soils. Paden soils have a fragipan in the upper part of the B2t horizon. Quitman soils are less gray and more brown and have less silt and less sand in the control section than Guyton soils.

Typical pedon of Guyton silt loam, 4.5 miles south of intersection of U.S. Highway 72 on State Highway 365, 0.2 mile east on gravel road, and 100 feet north of gravel road, SW1/4SW1/4 sec. 3, T. 4 S., R. 9 E.

A1—0 to 5 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; many fine and medium roots; very strongly acid; clear wavy boundary; strongly acid; clear irregular boundary.

A21g—5 to 10 inches; gray (10YR 6/1) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; many fine roots; very strongly acid; clear irregular boundary.

A22g—10 to 15 inches; gray (10YR 6/1) silt loam; many medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; slightly compact and brittle; many fine and medium roots; very strongly acid; clear irregular boundary.

B&A—15 to 23 inches; gray (10YR 5/1) silty clay loam (B); few medium distinct strong brown (7.5YR 5/6) mottles; tongues of gray (10YR 6/1) silt loam (A) between prisms; moderate coarse prismatic structure parting to moderate medium subangular blocky; friable; discontinuous clay films on faces of peds; strong brown areas are slightly brittle; tongues of gray silt loam make up about 20 percent of material; common fine roots; very strongly acid; clear irregular boundary.

B21tg—23 to 30 inches; grayish brown (10YR 5/2) silty clay loam; few medium faint yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; few pockets and tongues of gray (10YR 6/1) silt loam; many clay films on faces of peds; very strongly acid; clear irregular boundary.

B22tg—30 to 43 inches; grayish brown (10YR 5/2) silt loam; common fine faint yellowish brown (10YR 5/6) and brown (10YR 5/3) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; pockets and tongues of gray (10YR 6/1) very fine sandy loam; dark gray (10YR 4/1) clay accumulations at bases of some tongues; many clay films on faces of peds; very strongly acid; gradual irregular boundary.

B3tg—43 to 64 inches; gray (10YR 6/1) silt loam; many medium to coarse yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; firm; few pockets and tongues of light gray (10YR 7/1) very fine sandy loam; patchy clay films on faces of peds; very strongly acid.

Solum thickness ranges from 50 to 80 inches. Reaction is very strongly acid or strongly acid throughout.

The A1 and Ap horizons have hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The A2g horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. Mottles in shades of brown range from few to many.

The B2tg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It has few to many mottles in shades of gray or brown. The texture is silt loam, silty clay loam, or clay loam. The upper 20 inches of the B2tg horizon ranges from 20 to 35 percent clay.

Jena series

The Jena series consists of well drained, nearly level soils that formed in loamy alluvium on flood plains. These soils are occasionally flooded. Slopes range from 0 to 2 percent. The soils of the Jena series are coarse-loamy, siliceous, thermic Fluventic Dystrochrepts.

Jena soils are associated with Kirkville and Mantachie soils. Kirkville soils, which are in lower positions on flood plains, have mottles of chroma 2 or less within 24 inches of the surface. Mantachie soils, which are on flood plains, are in a fine-loamy family and have grayer colors in the B horizon.

Typical profile of Jena silt loam, on the west side of Bear Creek, north of State Highway 30, and 200 feet north of pavement, SW1/4NE1/4 sec. 20, T. 5 S., R. 11 E.

A1—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

B21—6 to 14 inches; yellowish brown (10YR 5/4) silt loam; weak medium granular structure; friable; few fine roots; few small pebbles; strongly acid; clear smooth boundary.

B22—14 to 29 inches; yellowish brown (10YR 5/4) loam; few fine faint pale brown mottles; weak fine and medium subangular blocky structure; friable; few small pebbles; few small brown and black concretions; very strongly acid; gradual smooth boundary.

C1—29 to 50 inches; dark yellowish brown (10YR 4/4) loamy fine sand; few fine faint yellowish brown mottles; single grained; loose; few small brown and black concretions; very strongly acid; gradual smooth boundary.

C2—50 to 65 inches; dark yellowish brown (10YR 4/4) loamy fine sand; few fine faint pale brown mottles; single grained; loose; very strongly acid.

Solum thickness is 20 to 50 inches. Reaction is very strongly acid or strongly acid except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 3.

The B horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 6. Texture is silt loam, loam, or sandy loam. Clay content, by weighted average, in the 10- to 40-inch control section is 10 to 18 percent.

The C horizon has hue of 10YR, value of 4 to 6, and chroma of 3 to 6. Texture is sandy loam or loamy fine sand.

Kirkville series

The Kirkville series consists of moderately well drained, nearly level soils that formed in loamy material on flood plains. These soils are occasionally flooded. Slopes range from 0 to 2 percent. The soils of the Kirkville series are coarse-loamy, siliceous, thermic Fluvaquentic Dystrochrepts.

Kirkville soils are associated with Jena and Mantachie soils. Jena soils, which are in slightly higher positions on flood plains, do not have mottles of chroma 2 or less within 24 inches of the surface. Mantachie soils, which are in slightly lower positions, have a fine-loamy control section and a grayer B horizon.

Typical profile of Kirkville loam, 4.5 miles south of intersection of U.S. Highway 72 along State Highway 25 and about 150 feet east of State Highway 25, SE1/4NW1/4 sec. 11, T. 4 S., R. 10 E.

A1—0 to 6 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; very friable; common fine roots; strongly acid; clear wavy boundary.

B21—6 to 18 inches; yellowish brown (10YR 5/4) sandy loam; weak medium granular structure; friable; few fine roots; strongly acid; clear wavy boundary.

B22—18 to 22 inches; yellowish brown (10YR 5/4) sandy loam; few fine distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few fine roots; strongly acid; clear wavy boundary.

B23—22 to 40 inches; yellowish brown (10YR 5/6) sandy loam; many medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; weak medium and coarse subangular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.

B24g—40 to 65 inches; gray (10YR 6/1) loam; many medium distinct yellowish brown (10YR 5/6) and few fine prominent yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; friable; few black concretions; strongly acid.

Solum thickness ranges from 30 to more than 60 inches. Reaction is very strongly acid or strongly acid throughout, except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The B21 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. In some pedons, it has mottles that are 2 or less in chroma. In places, the horizon is mottled in shades of brown and gray.

The B22 horizon has matrix colors similar to those in the B21 horizon, but it has few to many mottles of chroma 2 or less or is mottled in shades of brown and gray.

The lower part of the B horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It has few to many mottles in shades of brown and yellow, or it is mottled in shades of brown and gray. The texture of the B horizon is loam, sandy loam, or fine sandy loam. Clay content, by weighted average, in the 10- to 40-inch control section is 10 to 18 percent.

Mantachie series

The Mantachie series consists of somewhat poorly drained, nearly level soils that formed in loamy alluvium on flood plains. These soils are occasionally flooded. Slopes range from 0 to 2 percent. The soils of the Mantachie series are fine-loamy, siliceous, acid, thermic Aeric Fluvaquents.

Mantachie soils are on the same landscape as Jena and Kirkville soils. The Jena soils, which are on higher-lying areas along streambanks, are more brown and less gray in the B horizon than Mantachie soils and have a lower content of silt. The Kirkville soils, which are on slightly higher long and narrow areas, are more brown and less gray in the upper part of the B horizon.

Typical pedon of Mantachie loam, 1.8 miles west of State Highway 25 along State Highway 4, 0.6 mile north of State Highway 4 on paved county road, and 50 feet east, NE1/4NE1/4 sec. 17, T. 6 S., R. 10 E.

Ap—0 to 6 inches; dark brown (10YR 4/3) loam; weak fine granular structure; friable; common fine roots; very strongly acid; abrupt smooth boundary.

B21—6 to 11 inches; dark yellowish brown (10YR 4/4) loam; weak fine and medium subangular blocky structure; friable; few fine roots; very strongly acid; clear wavy boundary.

B22—11 to 18 inches; dark brown (10YR 4/3) loam; common medium distinct light brownish gray mottles (10YR 6/2); weak fine and medium subangular blocky structure; friable; common medium prominent black (N 2/0) stains; very strongly acid; clear wavy boundary.

B23g—18 to 36 inches; gray (10YR 6/1) loam; weak fine and medium subangular blocky structure; friable; common medium prominent black (N 2/0) stains and concretions; very strongly acid; gradual wavy boundary.

B24g—36 to 48 inches; light brownish gray (10YR 6/2) loam; common medium distinct strong brown (7.5YR

5/6) and yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

B25g—48 to 65 inches; gray (10YR 6/1) loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; very strongly acid.

Solum thickness ranges from 30 to 65 inches. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 6.

The upper part of the B horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 6. It has few to many grayish mottles or is mottled in shades of brown and gray or yellow. The lower part of the B horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. It has mottles in shades of brown and red. It is clay loam, loam, sandy loam, sandy clay loam, or silt loam. Clay content, by weighted average, of the 10- to 40-inch control section ranges from 18 to 34 percent.

Ora series

The Ora series consists of moderately well drained, gently sloping to strongly sloping soils that have a fragipan. These soils formed in loamy material on uplands. Slopes range from 2 to 12 percent. The soils of the Ora series are fine-loamy, siliceous, thermic Typic Fragiudults.

Ora soils are associated with Paden, Ruston, Savannah, and Smithdale soils. Paden soils, which are in lower lying areas, are in a fine-silty family. Ruston soils, which are on ridgetops in uplands, do not have a fragipan. Savannah soils, which are on broader ridgetops, have a Bt horizon in hue of 7.5YR or yellower. Smithdale soils, which are on side slopes, do not have a fragipan.

Typical pedon of Ora loam, 2 to 5 percent slopes, eroded, 1.5 miles west of Tishomingo on county road and 10 feet south of road, SE1/4NW1/4 sec. 21, T. 5 S., R. 10 E.

Ap—0 to 6 inches; yellowish brown (10YR 5/4) loam; weak fine granular structure; friable; few fine roots; very strongly acid; abrupt smooth boundary.

B2t—6 to 25 inches; yellowish red (5YR 5/8) clay loam; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

Bx1—25 to 35 inches; mottled red (2.5YR 4/8), yellowish brown (10YR 5/6), yellowish red (5YR 5/8), and light gray (10YR 7/2) loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, compact and brittle in about 65 percent of the mass; many fine voids; patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bx2—35 to 47 inches; mottled red (2.5YR 4/8), yellowish brown (10YR 5/6), yellowish red (5YR 5/8), and light gray (10YR 7/2) sandy clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, compact and brittle in about 65 percent of the mass; many fine voids; patchy clay films on faces of peds; very strongly acid; clear wavy boundary.

C—47 to 70 inches; mottled red (2.5YR 4/8) yellowish brown (10YR 5/6), yellowish red (5YR 5/8), light gray (10YR 7/2) loam; friable; strongly acid.

Depth to the fragipan ranges from 18 to 34 inches. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed.

The Ap or A2 horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Eroded units range to hue of 7.5YR, value of 4 or 5, and chroma of 4.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 to 8. Texture is loam, clay loam, or sandy clay loam. Clay content, by weighted average, of the Bt horizon is 18 to 33 percent.

The Bx and C horizons are yellowish red and have mottles of brown and gray or are mottled in shades of red, brown, yellow, and gray. Texture is a sandy loam, loam, or sandy clay loam.

Paden series

The Paden series consists of moderately well drained, nearly level soils that have a fragipan. These soils formed in a thin mantle of silty material underlain by loamy material on nearly level terraces and uplands. Slopes range from 0 to 2 percent. The soils of the Paden series are fine-silty, mixed, thermic Glossic Fragiudults.

Paden soils are associated with Guyton, Ora, and Savannah soils. Guyton soils, which are in depressions and on broad flats, are dominantly gray below the surface layer and are fine-silty in the control section. Ora soils, which are on higher lying ridges, have a Bt horizon that has hue of 5YR or redder and are higher in sand content. Savannah soils, which are in similar positions, are fine-loamy in the control sections.

Typical pedon of Paden silt loam, 0 to 2 percent slopes, 0.1 mile east of Golden on State Highway 366 and 60 feet south of pavement, NW1/4SE1/4 sec. 7, T. 7 S., R. 11 E.

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; very friable; common fine roots; strongly acid; abrupt smooth boundary.

B21—6 to 13 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; common fine roots; strongly acid; clear wavy boundary.

B22—13 to 20 inches; yellowish brown (10YR 5/4) silt loam; few medium faint strong brown mottles; moderate medium subangular blocky structure; friable; common fine roots; strongly acid; clear wavy boundary.

A'2&Bx1—20 to 25 inches; mottled pale brown (10YR 6/3), yellowish brown (10YR 5/4) (Bx1), and light brownish gray (10YR 6/2) (A'2) silt loam; moderate medium subangular blocky structure; friable; slightly brittle; common fine vesicular pores; strongly acid; clear wavy boundary.

Bx2—25 to 40 inches; mottled yellowish brown (10YR 5/4), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/6) silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, compact, and brittle in about 65 percent of the mass; few voids; patchy clay films on faces of peds and in cracks; strongly acid; gradual wavy boundary.

IIB2t—40 to 70 inches; mottled gray (10YR 6/1), strong brown (7.5YR 5/6), and yellowish brown (10YR 5/4) loam; moderate medium subangular blocky structure; firm; continuous clay films on faces of peds; few black concretions; strongly acid.

Solum thickness is more than 50 inches and commonly more than 72 inches. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Depth to the fragipan ranges from 18 to 24 inches.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4.

The B2 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 8. Texture is silt loam or silty clay loam. Clay content, by weighted average, in the B horizon is 20 to 32 percent above the fragipan and sand content averages less than 15 percent fine and coarser sand.

The A'2&Bx1 horizon is mottled in shades of brown and gray. In some pedons the A'2 bodies may be small.

The Bx horizon is mottled in shades of brown and gray. Texture is silt loam, silty clay loam, or clay loam.

The IIBt has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 6 to 8, or it is mottled in shades of gray and brown.

Quitman series

The Quitman series consists of somewhat poorly drained, nearly level soils formed in loamy material on stream terraces. Slopes range from 0 to 2 percent. The soils of the Quitman series are fine-loamy, siliceous, thermic Aquic Paleudults.

Quitman soils are associated with Guyton and Savannah soils. Guyton soils, which are on broad wet flats, are in a fine-silty family and have a gray B horizon. Savannah soils, which are in slightly higher positions, have a fragipan.

Typical pedon of Quitman fine sandy loam, 0 to 2 percent slopes, 4 miles west of State Highway 25 along U.S. Highway 72 and 500 feet north of U.S. Highway 72, NW1/4SW1/4 sec. 17, T. 3 S., R. 10 E.

Ap—0 to 4 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; fine roots; strongly acid; abrupt smooth boundary.

A2—4 to 10 inches; pale brown (10YR 6/3) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; strongly acid; clear smooth boundary.

B21t—10 to 22 inches; yellowish brown (10YR 5/4) loam; common fine faint strong brown (7.5YR 5/6) and few medium distinct light brownish gray (10YR 6/2) mottles; moderate fine and medium subangular blocky structure; friable; few patchy clay films on faces of peds; very strongly acid; clear wavy boundary.

B22t—22 to 36 inches; mottled light brownish gray (10YR 6/2), yellowish brown (10YR 5/4), and light yellowish brown (10YR 6/4) and strong brown (7.5YR 5/6) loam; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm, slightly compact and brittle in the strong brown portion, which comprises about 15 percent of the matrix; few brown concretions; few voids; few patchy clay films on yellowish brown and light brownish gray ped faces; few black splotches; very strongly acid; clear wavy boundary.

B23t—36 to 62 inches; mottled light gray (10YR 7/1), yellowish brown (10YR 5/4), and light yellowish brown (10YR 6/4) sandy loam; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm, slightly brittle and compact in the yellowish brown portion, which comprises about 10 percent of the matrix; nearly continuous clay films on faces of peds; strongly acid.

Solum thickness is 60 inches or more. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. In some pedons, there are brown or black concretions.

The Ap or A2 horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4.

The B21t has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 6. It has few to common mottles of chroma 2 or less. Texture is fine sandy loam, loam, or clay loam.

The B22t and B23t horizons have colors similar to those of the B21t horizon or are mottled in shades of gray, yellow, and brown. The lower part of the Bt horizon is slightly compact and brittle. Texture is sandy loam, sandy clay loam, or loam. Clay content, by weighted average, in the upper 20 inches of the B horizon is 18 to 32 percent.

Ruston series

The Ruston series consists of well drained, gently sloping to sloping soils that formed in loamy marine sediments on uplands. Slopes range from 2 to 8 percent. The soils of the Ruston series are fine-loamy, siliceous, thermic Typic Paleudults.

Ruston soils are associated with Ora, Saffell, and Smithdale soils. Ora soils, which are on ridgetops, have a fragipan. Saffell soils, which are on ridgetops and side slopes, have a loamy-skeletal control section. Smithdale soils, which are on side slopes of ridges, do not have a bisequel profile.

Typical pedon of Ruston sandy loam, 2 to 5 percent slopes, eroded, 2 miles east of the intersection of State Highways 25 and 364 at Midway on paved road, north 0.5 mile on intersecting paved road, and 150 feet east, NE1/4SE1/4 sec. 12, T. 4 S., R. 10 E.

Ap—0 to 5 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

B21t—5 to 13 inches; yellowish red (5YR 4/6) loam; moderate medium subangular blocky structure; friable; few sand grains coated and bridged with clay; strongly acid; clear smooth boundary.

B22t—13 to 24 inches; yellowish red (5YR 4/6) clay loam; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; sand grains coated and bridged with clay; strongly acid; clear wavy boundary.

B&A'2—24 to 34 inches; yellowish red (5YR 4/6) sandy clay loam (B); weak medium subangular blocky structure; friable; pockets about 1/2 inch to 2 inches in diameter of pale brown (10YR 6/3) (A'2) fine sandy loam, uncoated sand grains in masses of about 1/4 to 1/2 inch in diameter that make up approximately 30 percent of the horizon; few thin patchy clay films on faces of peds in B part; strongly acid; clear smooth boundary.

B'21t—34 to 68 inches; red (2.5YR 4/6) sandy clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; thin patchy clay films on faces of peds; strongly acid; clear wavy boundary.

B'22t—68 to 80 inches; red (2.5YR 4/6) sandy loam; common medium distinct strong brown (7.5YR 5/6) mottles; massive; friable; strongly acid.

Solum thickness is more than 60 inches. Reaction ranges from very strongly acid to strongly acid throughout except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4.

The Bt and B't horizons have hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8, and, in places, they have a few pockets of uncoated sand grains in the lower part of the horizon. Texture is loam, clay loam, or sandy clay loam. Clay content, by weighted average, in the control section is 18 to 30 percent. In places, quartz gravel and fragments of ironstone are in the lower Bt horizon.

The A'2 horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is fine sandy loam or sandy loam in streaks and pockets that, in places, make up as much as 50 percent of the horizon.

Saffell series

The Saffell series consists of well drained, moderately steep to steep soils that formed in gravelly sediment on uplands. Slopes range from 12 to 40 percent. The soils of the Saffell series are loamy-skeletal, siliceous, thermic Typic Hapludults.

Saffell soils are associated with Ruston and Smithdale soils. Ruston soils, which are on ridges, have bisequel profiles. Smithdale soils, which are on side slopes, have fine-loamy control sections.

Typical pedon of Saffell gravelly loam, in an area of Saffell-Smithdale association, hilly, 4 miles east of State Highway 25 at Midway along State Highway 364, 1 mile north of State Highway 364 on county road, and 30 feet east, NW1/4SW1/4 sec. 9, T. 4 S., R. 11 E.

A1—0 to 6 inches; dark brown (10YR 4/3) gravelly loam; weak fine granular structure; friable; many fine roots; about 25 percent by volume of gravel; very strongly acid; abrupt smooth boundary.

B2t—6 to 18 inches; yellowish red (5YR 4/6) gravelly loam; moderate medium subangular blocky structure; friable; clay films on faces of peds; about 40 percent by volume of gravel; strongly acid; clear wavy boundary.

B3—18 to 34 inches; strong brown (7.5YR 5/6) gravelly loam; moderate medium subangular blocky structure; friable; about 50 percent by volume of gravel; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

C—34 to 80 inches; mottled yellowish red (5YR 4/6), yellowish brown (10YR 5/6), and gray (10YR 6/1) very gravelly sandy loam; weak fine and medium subangular blocky structure; friable; about 80 percent by volume of gravel; very strongly acid.

Solum thickness ranges from 35 to 60 inches. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed.

The A1 horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4.

The B2 and B3 horizons have hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 8. Texture is gravelly sandy clay loam, gravelly loam, or gravelly fine sandy loam. Gravel content, by volume, ranges from 35 to 65 percent. Clay content, by weighted average, in the upper 20 inches of the B horizon is 12 to 28 percent.

The C horizon is very gravelly loamy sand or very gravelly sandy loam. Gravel content, by volume, ranges from 20 to 80 percent.

Savannah series

The Savannah series consists of moderately well drained, nearly level to gently sloping soils that have a fragipan. These soils formed in loamy material on terraces and uplands. Slopes range from 0 to 5 percent. The soils of the Savannah series are fine-loamy, siliceous, thermic Typic Fragiudults.

Savannah soils are associated with Ora, Paden, and Quitman soils. Ora soils, which are on ridges, have a Bt horizon that has hue of 5YR or redder. Paden soils, which are on broad, nearly level uplands, have fine-silty control sections. Quitman soils, which are in wet flats, have grayer colors and do not have a fragipan.

Typical pedon of Savannah silt loam, 2 to 5 percent slopes, eroded, 6 miles south of U.S. Highway 72 at Burnsville on State Highway 365, 0.5 mile east on county road, and 150 feet east of road, SW1/4SE1/4 sec. 3, T. 4 S., R. 9 E.

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

B21t—6 to 14 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; few fine roots; common clay films on faces of peds; strongly acid; gradual wavy boundary.

B22t—14 to 20 inches; yellowish brown (10YR 5/6) loam; moderate medium subangular blocky structure; friable; few fine roots; patchy clay films on faces of peds; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

Bx1—20 to 25 inches; yellowish brown (10YR 5/4) loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, compact and brittle in about 70 percent of the mass; few fine roots; common fine voids; patchy clay films on faces of peds and in cracks; narrow seams of gray (10YR 7/1) clay loam extending downward; strongly acid; gradual smooth boundary.

Bx2—25 to 36 inches; mottled yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/6) loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, compact and brittle in about 70 percent of the mass; few fine voids; continuous clay films on faces of peds; seams of gray (10YR 6/1) between prisms; strongly acid; gradual smooth boundary.

Bx3—36 to 60 inches; mottled yellowish brown (10YR 5/6), yellowish red (5YR 4/8), and gray (10YR 6/1) sandy clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky and angular blocky; firm, compact and brittle in about 60 percent of mass; slightly plastic; many voids; patchy clay films on faces of peds; seams of gray (10YR 6/1) clay loam between prisms; clay films on faces of peds; strongly acid.

Solum thickness is more than 60 inches. Depth to the fragipan ranges from 18 to 28 inches. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 3 to 6.

The Bt horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4 to 8. Texture is silt loam, silty clay loam, or loam. Clay content, by weighted average, in the Bt horizon is 18 to 32 percent.

The Bx horizon has a matrix mottled in shades of brown, red, and gray. Texture is sandy loam, loam, clay loam, or sandy clay loam.

The texture of the upper part of the Bt horizon of the Savannah soils in Tishomingo County is a silt loam. Silt loam B2t horizon textures, with silt content above 50 percent, are outside the allowable range in characteristics for the Savannah series. For this reason, the Savannah soils in this county are classified as a taxadjunct to the Savannah series.

Smithdale series

The Smithdale series consists of well drained, strongly sloping to steep soils that formed in loamy material on uplands. Slopes range from 8 to 40 percent. The soils of the Smithdale series are fine-loamy, siliceous, thermic Typic Paleudults.

Smithdale soils are associated with Ora, Ruston, and Saffell soils. Ora soils, which are on ridgetops, have a fragipan. Ruston soils, which are on ridges, have a bisequel profile. Saffell soils, which are on side slopes and tops of ridges, have a loamy-skeletal control section and overlie gravelly sediments.

Typical pedon of Smithdale sandy loam, 8 to 15 percent slopes, 1.2 miles west of Dennis on State Highway 4, 0.1 mile south on intersecting county road, and 50 feet east, NW1/4SE1/4 sec. 16, T. 6 S., R. 10 E.

Ap—0 to 6 inches; brown (10YR 5/3) sandy loam; weak fine granular structure; very friable; common fine roots; very strongly acid; abrupt smooth boundary.

B21t—6 to 46 inches; yellowish red (5YR 4/6) loam; moderate fine and medium subangular blocky structure; friable; common patchy clay films on faces of peds; very strongly acid; clear wavy boundary.

B22t—46 to 65 inches; yellowish red (5YR 4/6) sandy loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

B23t—65 to 80 inches; red (2.5YR 4/6) sandy loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few medium pockets of uncoated sand grains; very strongly acid.

Solum thickness is more than 60 inches. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. Texture is sandy loam or fine sandy loam.

The upper Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 to 8. Texture is sandy clay loam, clay loam, or loam. Clay content, by weighted average, in the upper 20 inches of the B horizon is 18 to 33 percent. The lower part of the B horizon has colors similar to those of the upper Bt horizon and has pockets of uncoated sand grains. Texture is loam or sandy loam.

formation of the soils

This section discusses the major factors and processes that have affected the formation and morphology of the soils of Tishomingo County. Soil, as used in this discussion, is a natural, three-dimensional body at the earth's surface. It is capable of supporting plants. It has properties resulting from the integrated effect of climate and living matter acting on parent material, as conditioned by relief, over periods of time.

Soils are formed through the interaction of five major factors: climate, plant and animal life, parent material, relief, and time. The relative influence of each factor varies from place to place, and in some places one factor dominates in the formation of a soil and determines most of its properties. Local variations in soils in Tishomingo County are caused mainly by differences in parent material, relief, and time.

Along the Tennessee-Tombigbee Waterway, the influence of man on soils has been great. With earth-moving equipment, man has reworked some soils and highly modified others beyond recognition of the original material.

climate

Tishomingo County has a moist temperate climate that is characteristic of the southeastern United States. Summers are hot, and winters are cool and fairly short. Annual precipitation is about 52 inches. Annual snowfall is about 4 inches. The average annual temperature is 60 degrees.

Generally the moist climate has caused strong weathering of the soils. Almost all of the soils are acid. Weathering and leaching have left the natural supply of plant nutrients low in most of the soils.

plant and animal life

All living organisms, including vegetation, bacteria and fungi, and animals, are important to soil formation. Vegetation generally supplies organic matter that decomposes and gives a dark color to soil surface horizons. Bacteria and fungi are responsible for decomposing vegetation and returning nutrients to the soil. Many of the organic reactions and processes of bacteria and fungi release materials that affect the soil-forming processes. Burrowing animals, earthworms, ants, cicada, and other insects mix soils and affect soil structure by making the soils more open and porous for movement of air and water.

Man also affects soil structure. He makes soils more porous in some places by tillage and management practices. In other places, however, man compacts the soils by foot and vehicle traffic and makes them more dense. Man's intensive use and disturbance of some soils has caused accelerated soil erosion, often accompanied by increased deposition on flood plains and in depressions. Man has also altered many soils chemically through the application of limestone and fertilizers, which make the soils more productive for desired plants. Man has introduced plants and animals not normally found in this area, and these will eventually affect the soil.

parent material

Parent material is the material from which soils form. It influences the mineral and chemical composition of the soils and to a large extent the rate at which soil formation takes place. Tishomingo County lies mostly within the Gulf Coastal Plain physiographic region and within the topographic division known as Tombigbee and Tennessee River hills.

Soils on the uplands formed in Coastal Plain sediments, and soils on the low terraces and flood plains formed in recent material washed from the uplands. The outcropping formations are mainly Upper Cretaceous but include an outcropping of Mississippian age along Pickwick Lake and a small outcropping of Devonian age along the Tennessee State line. For the most part, they consist of irregularly bedded sand, clay, gravel, and lignite; and individual beds vary greatly from place to place (*10*).

relief

Relief, or shape of the landscape, influences soil formation. It controls surface drainage and affects the percolation of water through the soil. Relief often affects the depth of soil, the plant and animal life, and some of the soil-forming processes. Soils on steeper slopes are more subject to erosion because of concentrated, rapid runoff. Soils in landscape depressions are usually wet; soils in higher convex areas have better drainage. Differences in topography cause free water to leave the well drained soils and to accumulate in the poorly drained soils.

The relief of Tishomingo County ranges from nearly level to steep. Slopes range from 0 to 40 percent.

time

A long period of time is required for soil formation. Differences in the ages of different soils account for most of the soil differences that are not attributed to other factors of soil formation. Soils along the streams are the youngest in the county. Older soils have a greater degree of horizon differentiation than the young soils. The soils on the uplands are the oldest in the county. Most of the soils that formed on the smoother parts of the uplands and on older stream terrraces have a well defined soil profile. These soils have an A horizon and a B horizon that has an accumulation of silicate clay.

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glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

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

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	More than 12

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to flooding.

Broad-base terrace. A ridge-type terrace built to control erosion by diverting runoff along the contour at a nonscouring velocity. The terrace is 10 to 20 inches high and 15 to 30 feet wide and has gently sloping sides, a rounded crown, and a dish-shaped channel along the upper side. It may be nearly level or have a grade toward one or both ends.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that loosen the subsoil and bring clods to the surface. A form of emergency tillage to control soil blowing.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds 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 when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

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

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Deferred grazing. Postponing grazing or arresting grazing for a prescribed period.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess alkali (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

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

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual.* The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

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.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

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

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation. Pits is an example.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor filter (in tables). Because of rapid permeability or an impermeable layer near the surface, the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

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

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

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

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to insure satisfactory performance of the soil for a specific use.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

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

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

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 physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded 1951-73 at Booneville, Miss.]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	49.7	29.5	39.6	75	4	12	5.12	2.56	7.34	7	1.6
February---	54.9	33.0	44.0	77	13	49	4.63	3.02	6.09	7	.7
March------	60.2	38.4	49.3	81	18	143	5.37	2.69	7.69	8	.7
April------	74.6	50.8	62.7	88	30	381	5.78	3.06	8.15	7	.0
May--------	81.6	58.4	70.0	93	39	620	3.98	2.57	5.24	6	.0
June-------	87.3	65.2	76.3	98	49	789	3.37	1.02	5.27	5	.0
July-------	91.1	68.6	79.9	101	56	927	3.73	2.50	4.84	6	.0
August-----	90.7	67.1	78.9	101	54	896	3.04	1.28	4.52	5	.0
September--	85.2	61.0	73.1	97	42	693	3.26	1.32	4.88	5	.0
October----	74.4	48.6	61.5	92	29	369	2.84	1.58	3.95	4	.0
November---	61.2	37.8	49.6	81	17	90	4.59	2.14	6.69	6	.0
December---	52.5	32.0	42.3	75	9	34	6.26	3.32	8.83	8	1.1
Yearly:											
Average--	72.0	49.2	60.6	---	---	---	---	---	---	---	---
Extreme--	---	---	---	103	4	---	---	---	---	---	---
Total----	---	---	---	---	---	5,003	51.97	42.99	62.88	74	4.1

[1]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded 1951-73 at Booneville, Miss.]

Probability	Temperature: 24° F or lower	Temperature: 28° F or lower	Temperature: 32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 28	April 3	April 16
2 years in 10 later than--	March 19	March 28	April 11
5 years in 10 later than--	March 1	March 15	April 2
First freezing temperature in fall:			
1 year in 10 earlier than--	November 3	October 28	October 19
2 years in 10 earlier than--	November 9	November 1	October 23
5 years in 10 earlier than--	November 20	November 9	October 31

TABLE 3.--GROWING SEASON

[Recorded 1951-73 at Booneville, Miss.]

Probability	Daily minimum temperature: Higher than 24° F	Daily minimum temperature: Higher than 28° F	Daily minimum temperature: Higher than 32° F
	Days	Days	Days
9 years in 10	230	215	192
8 years in 10	242	223	199
5 years in 10	263	239	211
2 years in 10	285	255	223
1 year in 10	296	263	229

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
Gu	Guyton silt loam	545	0.2
Je	Jena silt loam	3,585	1.3
Kr	Kirkville loam	5,115	1.8
Ma	Mantachie loam	25,210	9.0
OrB2	Ora loam, 2 to 5 percent slopes, eroded	1,945	0.7
OrC2	Ora loam, 5 to 8 percent slopes, eroded	10,165	3.6
OrD2	Ora loam, 8 to 12 percent slopes, eroded	2,785	1.0
PaA	Paden silt loam, 0 to 2 percent slopes	710	0.3
Pt	Pits	395	0.1
Qu	Quitman fine sandy loam, 0 to 2 percent slopes	1,145	0.4
Rs	Rock outcrop-Smithdale complex, 15 to 30 percent slopes	405	0.2
RuB2	Ruston sandy loam, 2 to 5 percent slopes, eroded	1,170	0.4
RuC2	Ruston sandy loam, 5 to 8 percent slopes, eroded	15,430	5.5
SA	Saffell-Smithdale association, hilly	21,025	7.5
ShA	Savannah silt loam, 0 to 2 percent slopes	715	0.3
ShB2	Savannah silt loam, 2 to 5 percent slopes, eroded	10,565	3.8
SmD	Smithdale sandy loam, 8 to 15 percent slopes	10,935	3.9
SmE	Smithdale sandy loam, 15 to 30 percent slopes	8,955	3.2
SR	Smithdale-Ruston association, hilly	149,985	53.6
UD	Udorthents, loamy, nearly level	3,190	1.2
	Water	5,665	2.0
	Total	279,640	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability	Cotton lint	Corn	Soybeans	Common bermudagrass	Improved bermudagrass	Tall fescue
		Lb	Bu	Bu	AUM*	AUM*	AUM*
Gu: Guyton	IIIw	---	---	23	6.5	---	---
Je: Jena	IIw	700	85	40	7.0	12.0	---
Kr: Kirkville	IIw	700	95	40	8.0	---	10.5
Ma: Mantachie	IIw	650	90	35	9.0	---	10.0
OrB2: Ora	IIe	700	80	35	6.5	8.5	8.0
OrC2: Ora	IIIe	600	70	30	6.0	8.0	7.5
OrD2: Ora	IVe	---	---	---	5.5	7.0	7.0
PaA: Paden	IIw	700	80	35	7.5	8.5	8.0
Pt.** Pits							
Qu: Quitman	IIw	650	80	30	7.5	10.0	9.0
Rs:** Rock outcrop.	VIIe						
Smithdale	VIIe	---	---	---	---	---	---
RuB2, RuC2: Ruston	IIe, IIIe	600	65	25	5.5	12.0	---
SA:** Saffell	VIIe	---	---	---	3.0	4.0	---
Smithdale	VIIe	---	---	---	---	---	---
ShA: Savannah	IIw	700	80	35	7.5	8.5	8.0
ShB2: Savannah	IIe	650	75	35	7.0	8.5	8.0
SmD: Smithdale	VIe	400	50	25	5.0	9.0	---
SmE: Smithdale	VIIe	---	---	---	---	---	---
SR:** Smithdale	VIIe	---	---	---	---	---	---
Ruston.	VIIe						
UD:** Udorthents.	---						

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	---	---	---	---	---
II	48,990	12,510	36,480	---	---
III	30,500	29,955	545	---	---
IV	2,785	2,785	---	---	---
V	---	---	---	---	---
VI	10,935	10,935	---	---	---
VII	160,279	160,279	---	---	---
VIII	---	---	---	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Trees to plant
Gu-------- Guyton	2w9	Slight	Severe	Moderate	---------	Loblolly pine	90	Loblolly pine, sweetgum.
						Slash pine	90	
						Sweetgum	---	
						Green ash	---	
						Southern red oak	---	
						Water oak	---	
Je-------- Jena	1o7	Slight	Slight	Slight	---------	Loblolly pine	100	Loblolly pine, slash pine, American sycamore, eastern cottonwood.
						Sweetgum	90	
						Water oak	80	
						Southern red oak	---	
						White oak	---	
						Slash pine	---	
Kr-------- Kirkville	1w8	Slight	Moderate	Moderate	Moderate	Cherrybark oak	100	Cherrybark oak, eastern cottonwood, loblolly pine, sweetgum, yellow-poplar.
						Loblolly pine	95	
						Sweetgum	100	
						Water oak	100	
Ma-------- Mantachie	1w8	Slight	Severe	Moderate	Severe	Green ash	80	Green ash, eastern cottonwood, cherrybark oak, loblolly pine, sweetgum, yellow-poplar.
						Eastern cottonwood	90	
						Cherrybark oak	100	
						Loblolly pine	98	
						Sweetgum	95	
						Yellow-poplar	95	
OrB2, OrC2, OrD2--- Ora	3o7	Slight	Slight	Slight	Moderate	Loblolly pine	83	Loblolly pine, slash pine.
						Shortleaf pine	69	
						Sweetgum	80	
PaA-------- Paden	3o7	Slight	Slight	Slight	Moderate	Loblolly pine	80	Loblolly pine, slash pine.
						Shortleaf pine	75	
						Sweetgum	80	
Qu-------- Quitman	2w8	Slight	Moderate	Slight	Slight	Water oak	90	Loblolly pine, slash pine, sweetgum, American sycamore, yellow-poplar.
						Loblolly pine	92	
						Slash pine	90	
						Sweetgum	93	
Rs:* Rock outcrop.								
Smithdale--------	3o1	Slight	Slight	Slight	Moderate	Loblolly pine	80	Loblolly pine.
						Shortleaf pine	69	
RuB2, RuC2-------- Ruston	3o1	Slight	Slight	Slight	---------	Loblolly pine	84	Loblolly pine.
						Shortleaf pine	75	
SA:* Saffell--------	4f2	Slight	Slight	Slight	---------	Loblolly pine	75	Loblolly pine, shortleaf pine.
						Shortleaf pine	65	
						White oak	---	
Smithdale--------	3o1	Slight	Slight	Slight	Moderate	Loblolly pine	80	Loblolly pine.
						Shortleaf pine	69	
ShA, ShB2-------- Savannah	3o7	Slight	Slight	Slight	Moderate	Loblolly pine	81	Loblolly pine, slash pine.
						Shortleaf pine	76	
						Southern red oak	75	
SmD, SmE-------- Smithdale	3o1	Slight	Slight	Slight	Moderate	Loblolly pine	80	Loblolly pine.
						Shortleaf pine	69	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
SR:*								
Smithdale----------	3o1	Slight	Slight	Slight	Moderate	Loblolly pine------- Shortleaf pine------	80 69	Loblolly pine.
Ruston-------------	3o1	Slight	Slight	Slight	---------	Loblolly pine------- Shortleaf pine------	84 75	Loblolly pine.
UD.* Udorthents								

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION

[Only the soils suitable for production of commercial trees are listed]

Map symbol and soil name	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
Gu----------------- Guyton	Favorable Normal Unfavorable	--- 1,800 ---	Longleaf uniola--- Pinehill bluestem--- Silver plumegrass---	35 20 15
Je----------------- Jena	Favorable Normal Unfavorable	--- 1,200 ---	Pinehill bluestem--- Longleaf uniola--- Beaked panicum--- Panicum---	50 25 10 8
Kr----------------- Kirkville	Favorable Normal Unfavorable	--- 1,800 ---	Pinehill bluestem--- Switchgrass--- Longleaf uniola---	30 25 25
Ma----------------- Mantachie	Favorable Normal Unfavorable	--- 2,000 ---	Longleaf uniola--- Pinehill bluestem---	35 20
OrB2, OrC2, OrD2--- Ora	Favorable Normal Unfavorable	--- 2,000 ---	Longleaf uniola--- Pinehill bluestem--- Beaked panicum--- Switchgrass--- Broomsedge bluestem---	30 20 15 5 5
PaA---------------- Paden	Favorable Normal Unfavorable	--- 1,600 ---	Pinehill bluestem--- Beaked panicum--- Longleaf uniola--- Switchcane---	25 30 20 20
Qu----------------- Quitman	Favorable Normal Unfavorable	--- 1,800 ---	Longleaf uniola--- Pinehill bluestem--- Carpetgrass--- Cutover muhly---	34 23 21 11
Rs:*				
Smithdale----------	Favorable Normal Unfavorable	--- 1,200 ---	Longleaf uniola--- Pinehill bluestem--- Beaked panicum--- Panicum---	30 25 12 12
RuB2, RuC2--------- Ruston	Favorable Normal Unfavorable	--- 1,200 ---	Longleaf uniola--- Pinehill bluestem--- Beaked panicum--- Panicum---	30 25 10 10
SA:*				
Saffell-----------	Favorable Normal Unfavorable	--- 1,000 ---	Pinehill bluestem--- Panicum--- Beaked panicum--- Threeawn---	40 15 10 10
Smithdale----------	Favorable Normal Unfavorable	--- 1,200 ---	Longleaf uniola--- Pinehill bluestem--- Beaked panicum--- Panicum---	30 25 12 12
ShA, ShB2---------- Savannah	Favorable Normal Unfavorable	--- 1,000 ---	Longleaf uniola--- Pinehill bluestem--- Beaked panicum--- Panicum---	30 30 15 10
SmD, SmE----------- Smithdale	Favorable Normal Unfavorable	--- 1,200 ---	Longleaf uniola--- Pinehill bluestem--- Beaked panicum--- Panicum---	30 25 12 12

See footnote at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Map symbol and soil name	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
SR:*				
Smithdale	Favorable	---	Longleaf uniola	30
	Normal	1,200	Pinehill bluestem	25
	Unfavorable	---	Beaked panicum	12
			Panicum	12
Ruston	Favorable	---	Longleaf uniola	30
	Normal	1,200	Pinehill bluestem	25
	Unfavorable	---	Beaked panicum	10
			Panicum	10

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails
Gu Guyton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.
Je Jena	Severe: flooding.	Slight	Moderate: flooding.	Severe: erodes easily.
Kr Kirkville	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.
Ma Mantachie	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
OrB2 Ora	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight.
OrC2 Ora	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Slight.
OrD2 Ora	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Slight.
PaA Paden	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.
Pt.* Pits				
Qu Quitman	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.
Rs:* Rock outcrop.				
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
RuB2 Ruston	Slight	Slight	Moderate: slope, small stones.	Slight.
RuC2 Ruston	Slight	Slight	Severe: slope.	Slight.
SA:* Saffell	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails
ShA-------------------- Savannah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.
ShB2------------------- Savannah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.
SmD-------------------- Smithdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
SmE-------------------- Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
SR:*				
Smithdale------------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Ruston----------------	Slight----------------	Slight----------------	Severe: slope.	Slight.
UD.* Udorthents				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
Gu------------------- Guyton	Fair	Fair	Fair	Fair	---	---	Good	Good	Fair	Fair	Good.
Je------------------- Jena	Poor	Fair	Fair	Good	Good	---	Poor	Poor	Fair	Good	Poor.
Kr------------------- Kirkville	Good	Good	Good	Good	---	---	Poor	Poor	Good	Good	Poor.
Ma------------------- Mantachie	Fair	Good	Good	Good	---	---	Fair	Fair	Good	Good	Fair.
OrB2----------------- Ora	Good	Good	Good	Good	---	---	Poor	Poor	Good	Good	Poor.
OrC2, OrD2----------- Ora	Fair	Good	Good	Good	---	---	Very poor.	Very poor.	Good	Good	Very poor.
PaA------------------ Paden	Fair	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Pt.* Pits											
Qu------------------- Quitman	Good	Good	Good	Good	---	Good	Fair	Poor	Good	Good	Poor.
Rs:* Rock outcrop.											
Smithdale------------	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
RuB2----------------- Ruston	Good	Good	Good	---	Good	---	Poor	Very poor.	Good	Good	Very poor.
RuC2----------------- Ruston	Fair	Good	Good	---	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
SA:* Saffell-------------	Very poor.	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.
Smithdale------------	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
ShA, ShB2------------ Savannah	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
SmD------------------ Smithdale	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
SmE------------------ Smithdale	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
SR:* Smithdale------------	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
SR:* Ruston	Fair	Good	Good	---	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
UD.* Udorthents											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Gu: Guyton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.
Je: Jena	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Kr: Kirkville	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
Ma: Mantachie	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.
OrB2: Ora	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.
OrC2: Ora	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: low strength, wetness.
OrD2: Ora	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: low strength, wetness, slope.
PaA: Paden	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.
Pt.*: Pits					
Qu: Quitman	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.
Rs:*: Rock outcrop.					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
RuB2: Ruston	Slight	Slight	Slight	Slight	Moderate: low strength.
RuC2: Ruston	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.
SA:*: Saffell	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ShA, ShB2: Savannah	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
SmD: Smithdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
SmE---------------- Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SR:*					
Smithdale---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ruston------------	Slight-----------	Slight-----------	Slight-----------	Moderate: slope.	Moderate: low strength.
UD.* Udorthents					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Gu: Guyton	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Je: Jena	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Fair: too sandy.
Kr: Kirkville	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
Ma: Mantachie	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
OrB2, OrC2: Ora	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
OrD2: Ora	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: slope, wetness.
PaA: Paden	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
Pt.*: Pits					
Qu: Quitman	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
Rs:*: Rock outcrop.					
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
RuB2, RuC2: Ruston	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
SA:*: Saffell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: small stones, slope.
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
ShA, ShB2: Savannah	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
SmD: Smithdale	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SmE------------------ Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
SR:*					
Smithdale----------	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Ruston-------------	Slight-----------	Severe: slope.	Moderate: too clayey.	Slight-----------	Fair: too clayey.
UD.* Udorthents					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
Gu----------------- Guyton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Je----------------- Jena	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Kr----------------- Kirkville	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ma----------------- Mantachie	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
OrB2, OrC2--------- Ora	Fair: low strength, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
OrD2--------------- Ora	Fair: low strength, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
PaA---------------- Paden	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
Pt.* Pits				
Qu----------------- Quitman	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Rs:* Rock outcrop.				
Smithdale-----------	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
RuB2, RuC2--------- Ruston	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
SA:* Saffell------------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Smithdale----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
ShA, ShB2---------- Savannah	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
SmD---------------- Smithdale	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
SmE---------------- Smithdale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
SR:*				
Smithdale-------------	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Ruston----------------	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
UD.* Udorthents				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Map symbol and soil name	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Gu----------------- Guyton	Moderate: seepage.	Severe: piping, wetness.	Severe: no water.	Percs slowly---	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Je----------------- Jena	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily, droughty.
Kr----------------- Kirkville	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding--------	Wetness---------	Favorable.
Ma----------------- Mantachie	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding--------	Wetness---------	Wetness.
OrB2, OrC2--------- Ora	Moderate: seepage.	Moderate: piping, wetness.	Severe: no water.	Slope-----------	Erodes easily, wetness.	Erodes easily, droughty.
OrD2--------------- Ora	Moderate: seepage.	Moderate: piping, wetness.	Severe: no water.	Slope-----------	Slope, erodes easily, wetness.	Slope, erodes easily, droughty.
PaA---------------- Paden	Moderate: seepage.	Severe: piping.	Severe: no water.	Percs slowly---	Erodes easily, wetness.	Erodes easily, rooting depth.
Pt.* Pits						
Qu----------------- Quitman	Slight----------	Severe: piping.	Severe: no water.	Favorable------	Wetness---------	Favorable.
Rs:* Rock outcrop.						
Smithdale---------	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope-----------	Slope.
RuB2, RuC2--------- Ruston	Moderate: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Favorable------	Favorable.
SA:* Saffell-----------	Severe: slope, seepage.	Slight----------	Severe: no water.	Deep to water	Slope-----------	Slope, droughty.
Smithdale---------	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope-----------	Slope.
ShA---------------- Savannah	Moderate: seepage.	Severe: piping.	Severe: no water.	Favorable------	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
ShB2--------------- Savannah	Moderate: seepage.	Severe: piping.	Severe: no water.	Slope-----------	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
SmD---------------- Smithdale	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope-----------	Slope.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
SmE Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
SR:*						
Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
Ruston	Moderate: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Favorable	Favorable.
UD.* Udorthents						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[Absence of an entry indicates that data were not estimated]

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Gu---------------- Guyton	0-15	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	65-90	<27	NP-7
	15-43	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	0	100	100	94-100	75-95	22-40	6-18
	43-64	Silt loam, silty clay loam, clay loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	51-95	<40	NP-18
Je---------------- Jena	0-6	Silt loam--------	ML, CL-ML	A-4	0	100	100	85-95	60-75	<22	NP-4
	6-29	Silt loam, very fine sandy loam, loam.	SM, ML, CL-ML, SM-SC	A-4, A-2	0	100	100	55-90	25-70	<22	NP-4
	29-65	Fine sandy loam, sandy loam, loamy fine sand.	SM	A-2, A-4	0	100	100	50-80	20-50	<22	NP
Kr---------------- Kirkville	0-6	Loam-------------	SM, ML, CL-ML	A-2, A-4	0	100	100	85-100	30-70	<20	NP-5
	6-65	Loam, sandy loam, fine sandy loam.	ML, SM, CL-ML, SM-SC	A-2, A-4	0	100	100	60-100	30-65	<20	NP-5
Ma---------------- Mantachie	0-6	Loam-------------	CL-ML, SM-SC, SM, ML	A-4	0-5	95-100	90-100	60-85	40-60	<20	NP-5
	6-65	Loam, clay loam, sandy clay loam.	CL, SC, SM-SC, CL-ML	A-4, A-6	0-5	95-100	90-100	80-95	45-80	20-40	5-15
OrB2, OrC2, OrD2- Ora	0-6	Loam-------------	SM-SC, SM, ML, CL-ML	A-4, A-2	0	100	95-100	65-85	30-65	<30	NP-5
	6-25	Clay loam, sandy clay loam, loam.	CL	A-6, A-4, A-7	0	100	95-100	80-100	50-80	25-48	8-22
	25-47	Sandy clay loam, loam, sandy loam.	CL	A-6, A-7, A-4	0	100	95-100	80-100	50-75	25-43	8-25
	47-70	Sandy clay loam, loam, sandy loam.	CL	A-6, A-7	0	100	95-100	80-98	50-60	30-49	11-30
PaA--------------- Paden	0-6	Silt loam--------	ML, CL, CL-ML	A-4	0	95-100	90-100	85-95	75-90	<30	3-10
	6-20	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	95-100	90-100	85-95	75-95	25-40	6-15
	20-40	Silt loam, clay loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	95-100	90-100	85-95	70-90	25-40	6-15
	40-70	Clay loam, clay, sandy clay loam.	CL, SC, GC	A-6, A-7	0-10	60-100	50-100	45-90	36-90	34-50	13-25
Pt.* Pits											
Qu---------------- Quitman	0-10	Fine sandy loam	SM, ML	A-4, A-2	0	100	100	85-100	30-55	<20	NP-3
	10-22	Fine sandy loam, loam.	SC, CL, CL-ML, SM-SC	A-4, A-6	0	100	100	90-100	40-70	20-35	4-15
	22-62	Sandy clay loam, loam, clay loam.	CL, SC	A-6, A-7	0	100	100	90-100	40-65	25-45	11-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Rs:* Rock outcrop.											
Smithdale--------	0-6	Sandy loam--------	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	6-46	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
	46-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
RuB2, RuC2-------- Ruston	0-5	Sandy loam--------	SM, ML	A-4, A-2	0	85-100	78-100	65-100	30-75	<20	NP-3
	5-24	Sandy clay loam, loam, clay loam.	SC, CL	A-6	0	85-100	78-100	70-100	36-75	30-40	11-20
	24-34	Fine sandy loam, sandy loam, loamy sand.	SM, ML, CL-ML, SM-SC	A-4, A-2	0	85-100	78-100	65-100	30-75	<27	NP-7
	34-80	Sandy clay loam, loam, clay loam.	SC, CL	A-6	0	85-100	78-100	70-100	36-75	30-42	11-20
SA:* Saffell----------	0-6	Gravelly loam-----	SM	A-2, A-4	0-5	75-85	55-80	45-70	30-45	<20	NP-3
	6-18	Gravelly fine sandy loam, gravelly sandy clay loam, gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-55	15-35	20-40	4-18
	18-34	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-65	20-55	15-35	20-40	4-18
	34-80	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
Smithdale--------	0-6	Sandy loam--------	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	6-46	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
	46-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
ShA, ShB2--------- Savannah	0-6	Silt loam---------	ML, CL-ML	A-4	0	100	100	80-100	60-90	<25	NP-7
	6-20	Sandy clay loam, clay loam, loam.	CL, SC, CL-ML	A-4, A-6	0	100	100	80-100	40-80	23-40	7-19
	20-60	Loam, clay loam, sandy clay loam.	CL, SC, CL-ML	A-4, A-6, A-7	0	100	100	80-100	40-80	23-43	7-19
SmD, SmE---------- Smithdale	0-6	Sandy loam--------	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	6-46	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
	46-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
SR:* Smithdale--------	0-6	Sandy loam--------	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	6-46	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
	46-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
SR:*											
Ruston----------	0-5	Sandy loam-------	SM, ML	A-4, A-2	0	85-100	78-100	65-100	30-75	<20	NP-3
	5-24	Sandy clay loam, loam, clay loam.	SC, CL	A-6	0	85-100	78-100	70-100	36-75	30-40	11-20
	24-34	Fine sandy loam, sandy loam, loamy sand.	SM, ML, CL-ML, SM-SC	A-4, A-2	0	85-100	78-100	65-100	30-75	<27	NP-7
	34-80	Sandy clay loam, loam, clay loam.	SC, CL	A-6	0	85-100	78-100	70-100	36-75	30-42	11-20
UD.*											
Udorthents											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
Gu------------------ Guyton	0-15	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low-----------	0.49	3	<2
	15-43	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low-----------	0.37		
	43-64	20-35	1.35-1.70	0.06-2.0	0.15-0.22	3.6-8.4	Low-----------	0.37		
Je------------------ Jena	0-6	14-27	1.30-1.80	0.6-2.0	0.12-0.20	4.5-6.0	Low-----------	0.37	5	.5-2
	6-29	10-18	1.40-1.80	0.6-2.0	0.10-0.20	4.5-5.5	Low-----------	0.28		
	29-65	5-20	1.35-1.65	2.0-6.0	0.08-0.14	4.5-5.5	Low-----------	0.24		
Kr------------------ Kirkville	0-6	14-27	1.30-1.50	0.6-2.0	0.15-0.22	4.5-5.5	Low-----------	----	---	.5-2
	6-65	10-18	1.35-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Low-----------	0.28		
Ma------------------ Mantachie	0-6	8-20	1.50-1.60	0.6-2.0	0.16-0.20	4.5-5.5	Low-----------	0.28	5	1-3
	6-65	18-34	1.50-1.60	0.6-2.0	0.14-0.20	4.5-5.5	Low-----------	0.28		
OrB2, OrC2, OrD2- Ora	0-6	10-25	1.45-1.55	2.0-6.0	0.10-0.13	3.6-5.5	Low-----------	0.32	3	1-3
	6-25	18-33	1.45-1.60	0.6-2.0	0.12-0.18	3.6-5.5	Low-----------	0.37		
	25-47	18-33	1.70-1.80	0.2-0.6	0.05-0.10	3.6-5.5	Low-----------	0.32		
	47-70	10-35	1.65-1.75	0.6-2.0	0.10-0.15	3.6-5.5	Low-----------	0.37		
PaA----------------- Paden	0-6	8-22	1.30-1.45	0.6-2.0	0.18-0.22	4.5-5.5	Low-----------	0.43	3	.5-3
	6-20	20-32	1.40-1.55	0.6-2.0	0.17-0.20	4.5-5.5	Low-----------	0.43		
	20-40	20-35	1.60-1.80	0.06-0.2	0.07-0.12	4.5-5.5	Low-----------	0.43		
	40-70	25-45	1.60-1.80	0.6-2.0	0.07-0.12	4.5-5.5	Low-----------	0.24		
Pt.* Pits										
Qu------------------ Quitman	0-10	5-15	1.40-1.55	0.6-2.0	0.13-0.16	4.5-5.5	Low-----------	0.28	3	1-3
	10-22	18-32	1.55-1.65	0.6-2.0	0.15-0.20	4.5-5.5	Low-----------	0.28		
	22-62	18-35	1.50-1.60	0.2-0.6	0.10-0.18	4.5-5.5	Low-----------	0.28		
Rs:* Rock outcrop.										
Smithdale--------	0-6	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	---
	6-46	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
	46-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		
RuB2, RuC2-------- Ruston	0-5	5-20	1.30-1.70	0.6-2.0	0.09-0.16	4.5-6.5	Low-----------	0.32	5	.5-2
	5-24	18-35	1.40-1.80	0.6-2.0	0.12-0.17	4.5-6.0	Low-----------	0.28		
	24-34	10-20	1.30-1.70	0.6-2.0	0.12-0.15	4.5-6.0	Low-----------	0.32		
	34-80	15-38	1.40-1.70	0.6-2.0	0.12-0.17	4.5-6.0	Low-----------	0.28		
SA:* Saffell----------	0-6	5-20	1.30-1.60	2.0-6.0	0.07-0.15	4.5-5.5	Low-----------	0.24	4	1-2
	6-18	10-35	1.25-1.60	0.6-2.0	0.06-0.10	4.5-5.5	Low-----------	0.28		
	18-34	12-35	1.25-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low-----------	0.28		
	34-80	10-25	1.30-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low-----------	0.17		
Smithdale--------	0-6	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	---
	6-46	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
	46-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		
ShA, ShB2---------- Savannah	0-6	3-16	1.45-1.65	0.6-2.0	0.16-0.20	4.5-5.5	Low-----------	0.37	3	.5-3
	6-20	18-32	1.55-1.75	0.6-2.0	0.13-0.20	4.5-5.5	Low-----------	0.28		
	20-60	18-32	1.60-1.80	0.2-0.6	0.05-0.10	4.5-5.5	Low-----------	0.24		
SmD, SmE---------- Smithdale	0-6	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	---
	6-46	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
	46-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm^3	In/hr	In/in	pH				Pct
SR:*										
Smithdale-------	0-6	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	---
	6-46	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
	46-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		
Ruston----------	0-5	5-20	1.30-1.70	0.6-2.0	0.09-0.16	4.5-6.5	Low-----------	0.32	5	.5-2
	5-24	18-35	1.40-1.80	0.6-2.0	0.12-0.17	4.5-6.0	Low-----------	0.28		
	24-34	10-20	1.30-1.70	0.6-2.0	0.12-0.15	4.5-6.0	Low-----------	0.32		
	34-80	15-38	1.40-1.70	0.6-2.0	0.12-0.17	4.5-6.0	Low-----------	0.28		
UD.*										
Udorthents										

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "brief," "apparent," and "perched" are explained in the text. Absence of an entry indicates that the feature is not a concern]

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Uncoated steel	Concrete
					Ft			In			
Gu----------------- Guyton	D	None---------	---	---	0-1.5	Perched	Dec-May	>60	---	High------	Moderate.
Je----------------- Jena	B	Occasional	Brief------	Dec-Apr	>6.0	---	---	>60	---	Low-------	High.
Kr----------------- Kirkville	C	Occasional	Brief------	Jan-Apr	1.5-2.5	Apparent	Jan-Apr	>60	---	Moderate	High.
Ma----------------- Mantachie	C	Occasional	Brief------	Jan-Mar	1.0-1.5	Apparent	Dec-Mar	>60	---	High------	High.
OrB2, OrC2, OrD2-- Ora	C	None---------	---	---	2.0-3.5	Perched	Feb-Apr	>60	---	Moderate	High.
PaA---------------- Paden	C	None---------	---	---	1.5-3.0	Perched	Dec-Mar	>60	---	High------	Moderate.
Pt.* Pits											
Qu----------------- Quitman	C	None---------	---	---	1.5-2.0	Perched	Jan-Mar	>60	---	High------	Moderate.
Rs:* Rock outcrop.											
Smithdale----------	B	None---------	---	---	>6.0	---	---	>60	---	Low-------	Moderate.
RuB2, RuC2--------- Ruston	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
SA:* Saffell-----------	B	None---------	---	---	>6.0	---	---	>60	---	Low-------	Moderate.
Smithdale----------	B	None---------	---	---	>6.0	---	---	>60	---	Low-------	Moderate.
ShA, ShB2---------- Savannah	C	None---------	---	---	1.5-3.0	Perched	Jan-Mar	>60	---	Moderate	High.
SmD, SmE----------- Smithdale	B	None---------	---	---	>6.0	---	---	>60	---	Low-------	Moderate.
SR:* Smithdale----------	B	None---------	---	---	>6.0	---	---	>60	---	Low-------	Moderate.
Ruston-------------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
UD.* Udorthents											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--PHYSICAL ANALYSES OF SELECTED SOILS

[Analyzed by the Soil Genesis and Morphology Laboratory of the Mississippi Agricultural and Forestry Experiment Station]

Soil series and laboratory number	Horizon	Depth	Particle-size distribution-- Total clay (<0.002 mm)	Total silt (0.05-0.002 mm)	Total sand (2.0-0.05 mm)
Jena:	A1	0-6	12.7	57.5	29.8
(S75MS-141-01)	B21	6-14	16.5	61.5	22.0
	B22	14-29	14.0	47.3	38.7
	C1	29-50	7.6	13.0	79.4
	C2	50-65	10.2	15.7	74.1
Kirkville:	A1	0-6	10.2	44.5	45.3
(S75MS-141-02)	B21	6-18	10.1	33.1	56.8
	B22	18-22	10.2	36.0	53.8
	B23	22-40	15.3	32.4	52.3
	B24	40-65	18.0	34.1	47.9
Quitman:	Ap	0-4	8.2	38.7	53.1
(S80MS-141-03)	A2	4-10	8.2	39.2	52.6
	B21t	10-22	21.4	44.1	34.5
	B22t	22-36	16.5	32.6	50.9
	B23t	36-62	19.6	26.1	54.3
Savannah:	Ap	0-6	6.3	55.3	38.4
(S79MS-141-01)	B21t	6-14	18.1	53.2	28.7
	B22t	14-20	18.5	49.5	32.0
	Bx1	20-25	17.9	45.1	37.0
	Bx2	25-36	14.1	38.6	47.3
	Bx3	36-60	20.6	22.5	56.9

TABLE 19.--CHEMICAL ANALYSES OF SELECTED SOILS

[Analyzed by the Soil Genesis and Morphology Laboratory of the Mississippi Agricultural and Forestry Experiment Station. Absence of an entry indicates value is less than 0.1]

Soil series and laboratory number	Horizon	Depth	Reaction 1:1 (soil to water)	Extractable cations-- Calcium	Magnesium	Potassium	Sodium	Extractable acidity	Sum of cations	Base saturation by sum cations
		In	pH	Milliequivalents per 100 grams						Pct
Guyton:*	A1	0-5	3.8	0.1	0.1	0.1	0.1	9.8	10.2	3.9
(S80MS-141-01)	A2g	5-10	4.1	0.1	---	---	---	4.1	4.2	2.4
	B21tg	10-42	4.1	0.1	0.1	0.1	0.1	6.6	7.0	5.7
	B22tg	42-50	4.6	0.7	0.1	0.1	0.8	12.3	14.0	12.1
	B23tg	50-63	4.2	3.8	2.0	0.1	7.6	7.0	20.5	65.8
Quitman:	Ap	0-4	6.5	5.8	0.1	0.1	0.1	1.6	7.7	79.2
(S80MS-141-03)	A2	4-10	6.7	4.6	---	---	---	1.6	6.2	74.2
	B21t	10-22	4.7	3.0	---	0.1	0.1	9.0	12.2	26.2
	B22t	22-36	4.9	1.0	0.6	0.1	0.1	7.1	8.9	20.2
	B23t	36-62	4.7	0.8	1.3	0.1	0.2	9.9	12.3	19.5

* Not the same pedon described as typical for the Guyton series.

TABLE 20.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Guyton	Fine-silty, siliceous, thermic Typic Glossaqualfs
Jena	Coarse-loamy, siliceous, thermic Fluventic Dystrochrepts
Kirkville	Coarse-loamy, siliceous, thermic Fluvaquentic Dystrochrepts
Mantachie	Fine-loamy, siliceous, acid, thermic Aeric Fluvaquents
Ora	Fine-loamy, siliceous, thermic Typic Fragiudults
Paden	Fine-silty, mixed, thermic Glossic Fragiudults
Quitman	Fine-loamy, siliceous, thermic Aquic Paleudults
Ruston	Fine-loamy, siliceous, thermic Typic Paleudults
Saffell	Loamy-skeletal, siliceous, thermic Typic Hapludults
*Savannah	Fine-loamy, siliceous, thermic Typic Fragiudults
Smithdale	Fine-loamy, siliceous, thermic Typic Paleudults
Udorthents	Loamy, siliceous, thermic Typic Udorthents

* Taxadjunct to the series. See series description of those characteristics of the soil that are outside the range of the series.

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