United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Alabama Agricultural Experiment Station and Alabama Soil and Water Conservation Committee

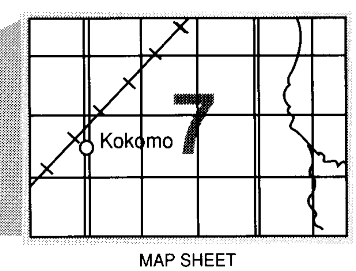
Soil Survey of Butler County, Alabama

How to Use This Soil Survey

General Soil Map

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

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

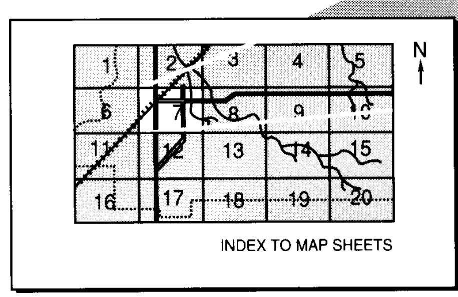


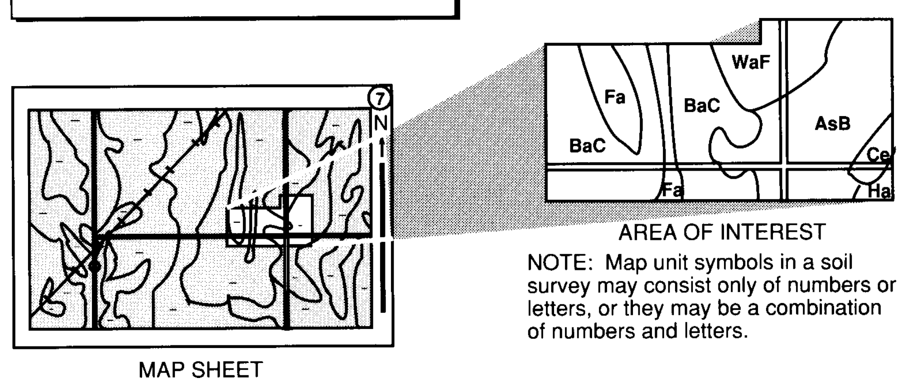
Detailed Soil Maps

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

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

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





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

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1990. Soil names and descriptions were approved in 1996. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1990. This survey was made cooperatively by the Natural Resources Conservation Service, the Alabama Agricultural Experiment Station, the Alabama Cooperative Extension System, the Alabama Soil and Water Conservation Committee, and the Alabama Department of Agriculture and Industries. The survey is part of the technical assistance furnished to the Butler County Soil and Water Conservation District. Union Camp Corporation and the Butler County Commission provided additional financial assistance for the survey.

Cover: Coastal bermudagrass hay in an area of Orangeburg sandy loam, 1 to 5 percent slopes. This soil is well suited to hay, pasture, and cultivated crops.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov (click on "Technical Resources").

Contents

Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the 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 ensure 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.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations that affect various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

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 Natural Resources Conservation Service or the Cooperative Extension System.

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State Conservationist
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Soil Survey of Butler County, Alabama

By Bobby C. Fox, Natural Resources Conservation Service

Fieldwork by Bobby C. Fox, Richard C. Corley, James A. Cotton, and
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United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
the Alabama Agricultural Experiment Station, the Alabama Cooperative Extension System,
the Alabama Soil and Water Conservation Committee, and the Alabama Department of
Agriculture and Industries

Butler County is in the south-central part of Alabama (fig. 1). It is almost square in shape, about 27 miles wide and 30 miles long. It has a total area of 498,650 acres, or about 779 square miles. The county is bounded on the north by Lowndes and Wilcox Counties; on the west by Wilcox, Monroe, and Conecuh Counties; on the south by Conecuh and Covington Counties; and on the east by Crenshaw County. In 1980, the population of the county was 21,680. Greenville, the largest city and the county seat, had a population of 8,000 *(2)*. It is in the north-central part of the county.

The county makes up part of the Southern Coastal Plain and the Alabama, Mississippi, and Arkansas Blackland Prairie Major Land Resource Areas. The elevation ranges from about 570 feet near Fort Dale in the northern part of the county to about 170 feet near Pigeon Creek in the southern part.

Butler County has a well developed transportation system. Interstate Highway 65 and U.S. Highway 31 run diagonally across the county in a northeast to southwest direction, and several state highways and numerous county highways serve all parts of the county. A railroad provides freight service through Greenville and Georgiana.

General Nature of the County

This section provides general information about the county. It gives a brief description of the history and development of the county, agriculture, water resources, mineral resources, and climate.

History and Development

Butler County was founded on December 13, 1819. It was created from parts of Conecuh and Monroe Counties by the Alabama Legislature, during the first legislative session after Alabama became a state. The county was named in honor of Captain William Butler.

The early settlers were mainly of English ancestry. They came to Butler County primarily from Georgia, South Carolina, North Carolina, Tennessee, Kentucky, and Virginia. The first permanent settlement, Dogwood Flat (which is now called Pine Flat), was in the western part of the county. It was settled in 1815 by James K. Benson. Greenville, which was originally called Buttsville, was established as the county seat in 1822 *(13)*.

Agriculture

Agriculture has always been important to the economy of Butler County. In recent years, the acreage of cultivated crops and improved pasture has gradually decreased and the acreage of pine woodland has increased. Currently, about 38,500 acres is used for cultivated crops, and about 40,000 acres is used for pasture and hay. The major crops are corn, grain sorghum, soybeans, cotton, and wheat. Specialty crops include tobacco, watermelon, peas, sod, and alfalfa. Beef cattle, dairy cattle, and hogs are the main livestock resources; however, the production of poultry is increasing. Timber and associated products are an important part of the agricultural resources of the county.

Figure 1.—Location of Butler County in Alabama.

Water Resources

Butler County has a well developed system of natural drainage. The northwestern part of the county is in the Alabama River Basin, and the remainder of the county is in the Conecuh River Basin. The Sepulga River, Persimmon Creek, and Pigeon Creek are the principal streams. They are potential sources of large supplies of surface water. Other important streams include Long Creek, Panther Creek, Rocky Creek, Pine Barren Creek, Cedar Creek, and Wolf Creek. Sherling Lake is the largest area of open water in the county.

Ground water is the source of most of the water for domestic and industrial uses in Butler County. The principal aquifers are sand beds in the Eutaw, Ripley, and Nanafalia Formations and limestone beds in the Clayton Formation. Sufficient water for domestic uses can generally be obtained from aquifers at a depth of less than 400 feet in most parts of the county. Water in sufficient quantity for industrial and municipal uses can be obtained from aquifers at depths ranging from about 400 feet to 2,000 feet *(24)*.

Mineral Resources

The minerals of economic importance in Butler County include iron ore, clay, sand, and limestone. Brown iron ore of commercial quality occurs primarily in the central and northern parts of the county, commonly in the Clayton and Porters Creek Formations. Low-grade, sandy bentonitic clay is in the southern part of the county, but it has not been developed commercially. Limestone that has potential value as crushed aggregate is available in the northwestern part of the county. Sand that can be used as fine aggregate material or as foundry sand is in the northwestern and southern parts of the county *(24)*.

Climate

Butler County has long, hot summers because moist tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short. Precipitation is fairly heavy throughout the year, and prolonged droughts are rare. Summer precipitation, mainly in the form of afternoon thunderstorms, is adequate for the growth of all crops.

Severe local storms, including tornadoes, strike occasionally in or near the county. They are short in duration and cause variable and spotty damage. Every few years in summer or fall, a tropical depression or a remnant of a hurricane that has moved inland causes extremely heavy rains for 1 to 3 days.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Greenville in the period 1961 to 1990. 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 49 degrees F and the average daily minimum temperature is 37 degrees. The lowest temperature on record, which occurred on January 21, 1985, is -1 degree. In summer, the average temperature is 68 degrees and the average daily maximum temperature is 91 degrees. The highest recorded temperature, which occurred on June 28, 1954, is 108 degrees.

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 degrees 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 about 56 inches. Of this, 29 inches, or 52 percent, usually falls in April through

October. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through October is less than 22 inches. The heaviest 1-day rainfall during the period of record was 8.4 inches on March 16, 1938. Thunderstorms occur on about 59 days each year, and most occur in July.

The average seasonal snowfall is about 0.4 inches. The greatest snow depth at any one time during the period of record was 6 inches. On the average, there are no days that have at least 1 inch of snow on the ground, although this number varies greatly from year to year.

The average relative humidity in midafternoon is about 56 percent. Humidity is higher at night, and the average at dawn is about 86 percent. The sun shines 63 percent of the time possible in summer and 51 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 8 miles per hour, in March.

How This Survey Was Made

This soil survey updates the survey of Butler County published in 1907 *(16)*. It provides additional information and has larger maps, which show the soils in greater detail.

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

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

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

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

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

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

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

This survey area was mapped at two levels of detail. At the more detailed level, map units are narrowly defined. Map unit boundaries were plotted and verified at closely spaced intervals. At the less detailed level, map units are broadly defined. Boundaries were plotted and verified at wider intervals. In the legend for the detailed soil maps, narrowly defined units are indicated by symbols in which the first letter is a capital and the second is lowercase. For broadly defined units, all letters are capitals.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

Soil Survey Procedures

The general procedures followed in making this survey are described in the “National Soil Survey Handbook” of the Natural Resources Conservation Service. The soil survey of Butler County, published in 1907 *(16)*, and the “Geology of Butler County, Alabama” *(14)* were among the references used.

Before the fieldwork began, preliminary boundaries of landforms were plotted stereoscopically on high-altitude aerial photographs. United States Geological Survey topographic maps and aerial photographs were studied to relate land and image features.

Traverses were made on foot and by vehicle, mostly at intervals of about one-fourth mile. They were made at closer intervals in areas of high variability. Soil examinations along the traverses were made 50, 100, and 300 feet apart, depending on the landscape and the soil patterns *(12, 15)*. Observations of landforms, uprooted trees, vegetation, roadbanks, and animal burrows were made continuously without regard to spacing. Soil boundaries were determined on the basis of soil examinations, observations, and photo interpretation. The soil material was examined with the aid of a spade, a hand auger, or a truck-mounted probe to a depth of 5 feet or more. The pedons described as typical were observed and studied in excavations.

Samples for chemical and physical analyses and engineering test data were taken from the site of the typical pedon of some of the major soils in the survey area. The analyses were made by the Agronomy and Soils Clay Mineralogy Laboratory, Auburn University, Auburn, Alabama, and by the Alabama Department of Highways and Transportation, Montgomery, Alabama. The results of some of the analyses are published in this soil survey report. Unpublished analyses and the laboratory procedures can be obtained from the laboratory.

High-altitude aerial photography base maps were used for mapping of soil and surface drainage in the field. Cultural features were transferred from U.S. Geological Survey 7.5-minute series topographic maps and were recorded from visual observations. Soil mapping, drainage patterns, and cultural features recorded on base maps were then transferred to half-tone film positives by cartographic technicians prior to the final map-finishing process.

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 unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another 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.

Each map unit is rated for cultivated crops, pasture and hay, woodland, and urban uses. Cultivated crops are those grown extensively in the survey area. Pasture and hay refer to improved, locally grown grasses and legumes. Woodland refers to areas of native or introduced trees. Urban uses include residential, commercial, and industrial developments.

The boundaries of the general soil map units in Butler County were matched, where possible, with those of the previously completed surveys of Conecuh, Covington, and Monroe Counties. In a few areas, however, the lines do not join and the names of the map units differ. These differences result mainly because of changes in soil series concepts, differences in map unit design, and changes in soil patterns near survey area boundaries.

1. Congaree-Leeper

Nearly level, moderately well drained and somewhat poorly drained soils that have a loamy surface layer and a loamy substratum or a clayey subsoil; formed in loamy and clayey alluvial sediments

This map unit consists of soils on the flood plain of Cedar Creek in the northwestern part of the county. Areas are long and narrow in shape. The soils are frequently flooded, but the duration of flooding is brief. Slopes range from 0 to 1 percent. The natural vegetation consists of bottom land hardwoods.

This unit makes up about 1 percent of the county. It is about 70 percent Congaree soils, 25 percent Leeper soils, and 5 percent soils of minor extent.

The moderately well drained Congaree soils are on the higher, more convex parts of stream flood plains. The surface layer is dark brown loam. The substratum is dark yellowish brown loam in the upper part, brown and dark yellowish brown fine sandy loam in the next part, and brown loamy sand in the lower part.

The somewhat poorly drained Leeper soils are on the lower parts of stream flood plains. The surface layer is brown clay loam. The subsoil is dark grayish brown silty clay in the upper part and dark gray clay in the lower part. The substratum is gray silty clay that has brownish mottles.

Of minor extent in this map unit are Bibb, Iuka, Macon, and Mantachie soils. The poorly drained Bibb soils are in depressions. Iuka soils are on the high parts of natural levees. They have less clay in the substratum than the Congaree soils. Macon soils are on terraces. They are not flooded frequently. The somewhat poorly drained Mantachie soils are on the lower parts of natural levees. They are loamy throughout.

Most areas of this unit are used as woodland and wildlife habitat. A few areas are used for pasture.

The soils in this map unit are poorly suited to cultivated crops, pasture, and hay. The choice of crops and pasture plants and the period of grazing are limited by wetness and flooding.

This map unit is suited to the production of hardwoods. Pine trees can be grown in areas of Congaree soils. Leeper soils are generally not suited to pine trees because they are alkaline within a depth of 20 inches. Common trees include sweetgum, water oak, green ash, yellow poplar, and American sycamore. Frequent flooding and wetness limit the use of equipment and increase the seedling mortality rate.

The soils in this map unit are poorly suited to most urban uses because of the frequent flooding and wetness.

2. Mantachie-Rains-Bethera

Nearly level, somewhat poorly drained and poorly drained soils that have a loamy surface layer and a loamy or a clayey subsoil; formed in loamy and clayey sediments

This map unit consists of soils on flood plains and low terraces of the Sepulga River, Persimmon Creek, Pigeon Creek, and other major streams. Mapped areas are long and narrow in shape. Numerous old channel scars and small depressions are scattered throughout the map unit. The soils in this unit are subject to occasional or frequent flooding. Slopes range from 0 to 1 percent. The natural vegetation consists of bottom land hardwoods in the lower areas on the landscape and mixed hardwoods and pine in the higher areas.

The unit makes up about 9 percent of the county. It is about 38 percent Mantachie soils, 32 percent Rains soils, 20 percent Bethera soils, and 10 percent soils of minor extent.

The somewhat poorly drained Mantachie and similar soils are on low or intermediate parts of stream flood plains. They are subject to frequent flooding. The surface layer is dark grayish brown loam. The subsoil is mottled brownish and grayish loam in the upper part and gray clay loam in the lower part.

The poorly drained Rains soils are on low terraces adjacent to stream flood plains. They are subject to occasional flooding. The surface layer is dark gray sandy loam. The subsurface layer is light brownish gray sandy loam. The subsoil is light gray sandy clay loam in the upper part, grayish brown sandy clay loam in the next part, and gray sandy clay loam and clay loam in the lower part.

The poorly drained Bethera soils are in landscape positions similar to those of the Rains soils. They are subject to occasional flooding. The surface layer is dark grayish brown fine sandy loam. The subsoil is grayish brown clay loam and clay in the upper part, gray clay in the next part, and grayish brown clay in the lower part.

Of minor extent in this map unit are Bibb, Bonneau, Cahaba, Iuka, Eunola, and Lynchburg soils. The poorly drained Bibb soils are in depressions on flood plains. Bonneau, Cahaba, Eunola, and Lynchburg soils are on low terraces at slightly higher elevations than the Rains and Bethera soils. Bonneau soils have thick sandy surface and subsurface layers. The well drained Cahaba soils have a reddish subsoil. The moderately well drained Eunola soils have a brownish subsoil. Lynchburg soils are somewhat poorly drained. Iuka soils are on the high parts of flood plains, and they are moderately well drained.

Most areas of this unit are used as woodland and wildlife habitat. A few areas have been cleared and are used for pasture.

The soils in this map unit are poorly suited to cultivated crops, pasture, and hay. The choice of crops and pasture plants and the period of grazing are limited by wetness and flooding.

This map unit is suited to hardwood and pine trees. Common trees include water oak, sweetgum, green ash, slash pine, and loblolly pine. Flooding and wetness limit the use of equipment and increase the seedling mortality rate.

The soils in this map unit are poorly suited to most urban uses because of the flooding and wetness.

3. Demopolis-Searcy-Watsonia

Gently sloping to steep, shallow, well drained soils and very deep, moderately well drained soils that have a loamy or a clayey surface layer and a loamy or a clayey subsoil; formed in material weathered from soft limestone (chalk) and clayey sediments

The landscape generally has varied relief in areas of this map unit. It is dominated by narrow, gently sloping ridgetops and strongly sloping to steep side slopes on uplands. Narrow flood plains border incised, mostly intermittent streams. The landscape is dissected by a well-defined, branching drainage system. Slopes are generally short and complex, and they range from 2 to 35 percent. The natural vegetation consists of eastern redcedar in areas of Demopolis soils and loblolly pine and mixed hardwoods in areas of Searcy and Watsonia soils.

This map unit makes up about 4 percent of the county. It is about 47 percent Demopolis soils, 20 percent Searcy soils, 10 percent Watsonia soils, and 23 percent soils of minor extent.

The shallow, well drained Demopolis soils are on narrow ridgetops and on side slopes. The surface layer is dark grayish brown loam. The substratum is dark grayish brown loam that has many fragments of soft limestone and concretions of calcium carbonate. The next layer is soft limestone bedrock.

The very deep, moderately well drained Searcy soils are on broad ridges and on toe slopes. The surface layer is brown sandy clay loam. The subsoil is yellowish red clay loam and red clay in the upper part; mottled red, light brownish gray, and yellowish brown clay in the next part; and mottled strong brown, yellowish brown, and gray clay in the lower part.

The shallow, well drained Watsonia soils are on narrow ridgetops. The surface layer is brown clay. The subsoil is yellowish red clay in the upper part, yellowish brown clay in the next part, and light olive brown clay in the lower part. The substratum is soft limestone bedrock.

Of minor extent in this map unit are Brantley, Congaree, Leeper, Macon, Oktibbeha, and Sumter soils. The very deep Brantley and Oktibbeha soils are on side slopes.

Brantley soils are well drained. Oktibbeha soils are alkaline below a depth of 30 inches. Congaree and Leeper soils are on narrow flood plains and are subject to frequent flooding. The well drained Macon soils are on terraces. The moderately deep Sumter soils are in landscape positions similar to those of the Demopolis soils.

Most areas of this unit are used as woodland and wildlife habitat. A few areas are used for pasture and hay.

The soils in this map unit are poorly suited to cultivated crops, pasture, and hay. The complex slopes, droughtiness, the shallow depth to bedrock, poor tilth, and the severe hazard of erosion are the main limitations.

The soils in this unit are suited to woodland. The potential productivity of loblolly pine and slash pine is extremely high in areas of Searcy soils and high in areas of Watsonia soils. Demopolis soils are not suited to pine trees because they are alkaline throughout the profile. Common trees include loblolly pine, longleaf pine, shortleaf pine, eastern redcedar, water oak, and sweetgum. The slope and clayey textures limit the use of logging equipment in steep areas. Erosion is a hazard along logging roads, landings, and skid trails. Droughtiness increases the seedling mortality rate in areas of Demopolis and Watsonia soils.

The soils in this map unit are poorly suited to most urban uses. The depth to rock, the shrink-swell potential, and the very slow permeability in the Demopolis and Watsonia soils and the wetness and the shrink-swell potential in the Searcy soils are limitations for most uses. The slope is a limitation for most urban uses in some areas.

4. Luverne-Troup-Smithdale

Gently sloping to steep, well drained and somewhat excessively drained soils that have a loamy or a sandy surface layer and a clayey or a loamy subsoil; formed in clayey, sandy, and loamy sediments

The landscape generally has varied relief in areas of this map unit. It is dominated by narrow to broad, gently sloping ridgetops and strongly sloping to steep side slopes on uplands. Narrow flood plains border incised, intermittent and perennial streams. The landscape is dissected by a well-defined, branching drainage system. Slopes are short and complex, and they range from 2 to 35 percent. The natural vegetation consists of pine and mixed hardwoods.

This map unit makes up about 16 percent of the county. It is about 30 percent Luverne soils, 25 percent Troup soils, 20 percent Smithdale soils, and 25 percent soils of minor extent.

The well drained Luverne soils are on narrow ridgetops and on side slopes. The surface layer is brown sandy loam. The subsurface layer is light yellowish brown sandy loam. The subsoil is yellowish red clay and sandy clay in the upper part and yellowish red clay loam in the lower part. The substratum is thinly stratified, yellowish red sandy loam, light gray clay, and strong brown sandy clay loam.

The somewhat excessively drained Troup soils are on the higher ridgetops and the upper parts of side slopes. The surface layer is dark brown loamy sand. The subsurface layer is yellowish red loamy sand. The subsoil is yellowish red sandy loam.

The well drained Smithdale soils are on the middle and upper parts of side slopes. The surface layer is dark grayish brown sandy loam. The subsurface layer is yellowish red sandy loam. The subsoil is red sandy clay loam in the upper part and red sandy loam in the lower part.

Of minor extent in this map unit are Alaga, Bibb, Iuka, Lucy, Mantachie, and Orangeburg soils. Alaga and Lucy soils are in landscape positions similar to those of the Troup soil. Alaga soils are sandy to a depth of 80 inches or more. Lucy soils have sandy surface and subsurface layers that range from 20 to 40 inches thick. Bibb, Iuka, and Mantachie soils are on narrow flood plains and are subject to frequent flooding. Orangeburg soils are on the high parts of ridgetops. They do not have thick sandy surface and subsurface layers, and they are loamy throughout the profile.

Most areas of this unit are forested. Areas that are used for cultivated crops, pasture, or hay or as sites for homes are scattered throughout the map unit, mainly on the broad ridgetops.

The soils in this map unit are poorly suited to cultivated crops and are suited to pasture and hay. Low fertility, complex slopes, and droughtiness are the main limitations. Erosion is a hazard if the soils are tilled. Applications of lime and fertilizer are needed for crops and pasture plants. Conservation tillage, terraces, grassed waterways, cover crops, and contour farming are management practices that help to maintain productivity and control erosion.

The soils in this unit are suited to woodland. The potential productivity of loblolly pine and slash pine is high. Common trees include loblolly pine, longleaf pine, shortleaf pine, southern red oak, sweetgum, and water oak. The slope limits the use of logging equipment in steep areas. Erosion is a hazard along logging roads, landings, and skid trails. The sandy texture of the Troup soils hinders the use of wheeled equipment, especially when the soils are very dry. Droughtiness increases the seedling mortality rate in areas of Troup soils.

The soils in this map unit are poorly suited to most urban uses. The slope is a limitation for most urban uses in some areas. The moderately slow permeability and moderate shrink-swell potential in the Luverne soils are limitations for some uses.

5. Arundel-Luverne

Gently sloping to steep, moderately deep and very deep, well drained soils that have a loamy surface layer and a clayey subsoil; formed in clayey sediments overlying claystone and in stratified clayey and loamy sediments

The landscape generally has varied relief in areas of this map unit. It is dominated by narrow to broad, gently sloping ridgetops and strongly sloping to steep side slopes on uplands. Narrow flood plains border incised, intermittent and perennial streams. The landscape is dissected by a well-defined, branching drainage system. Slopes are short and complex, and they range from 1 to 35 percent.

This map unit makes up about 5 percent of the county. It is about 65 percent Arundel soils, 15 percent Luverne soils, and 20 percent soils of minor extent.

The moderately deep Arundel soils are on narrow ridgetops and on side slopes. The surface layer is brown fine sandy loam. The subsoil is yellowish brown clay loam and strong brown clay in the upper part and dark yellowish brown clay in the lower part. The substratum is weathered claystone.

The very deep Luverne soils are on the lower parts of side slopes. The surface layer is brown sandy loam. The subsurface layer is light yellowish brown sandy loam. The subsoil is yellowish red clay and sandy clay in the upper part and yellowish red clay loam in the lower part. The substratum is thinly stratified, yellowish red sandy loam, light gray clay, and strong brown sandy clay loam.

Of minor extent in this map unit are Bibb, Halso, Iuka, Orangeburg, and Smithdale soils. The poorly drained Bibb and moderately well drained Iuka soils are on narrow flood plains and are subject to frequent flooding. Halso soils are in slightly higher positions than the Arundel soils and are deep over shale bedrock. Orangeburg soils are on high ridgetops and are loamy throughout the profile. Smithdale soils are in landscape positions similar to those of the Luverne soils. They are loamy throughout the profile.

Most areas of this unit are forested. Areas that are used for pasture or hay or as sites for homes are scattered throughout the map unit, mainly on broad ridgetops.

The soils in this map unit are poorly suited to cultivated crops and are suited to pasture and hay. The slope, the low fertility, the poor tilth, and the hazard of erosion are the main limitations. Applications of lime and fertilizer are needed for crops and pasture plants. Conservation tillage, terraces, grassed waterways, cover crops, and contour farming are management practices that are necessary to maintain productivity and control erosion.

The soils in this map unit are suited to woodland. The potential productivity of loblolly pine and slash pine is high. Common trees include loblolly pine, shortleaf pine, sweetgum, and water oak. The slope limits the use of logging equipment in steep areas. Erosion is a hazard along logging roads, landings, and skid trails. The low strength of the clayey subsoil limits the use of wheeled equipment when the soils are wet.

The soils in this map unit are poorly suited to most urban uses. The slope is a limitation for most urban uses in some areas. The depth to rock, the high shrink-swell potential, and the very slow permeability in the Arundel soils and the moderately slow permeability and moderate shrink-swell potential in the Luverne soils are limitations for some uses.

6. Luverne-Halso

Nearly level to strongly sloping, very deep and deep, well drained and moderately well drained soils that have a loamy surface layer and a clayey subsoil; formed in stratified clayey and loamy sediments and in clayey sediments overlying shale

The landscape generally has varied relied in areas of this map unit. It is dominated by narrow to broad, nearly level to gently sloping ridgetops and strongly sloping side slopes on uplands. Narrow flood plains border incised, intermittent and perennial streams. The landscape is dissected by a well-defined, branching drainage system. Slopes range from 1 to 15 percent. The natural vegetation consists of pine and mixed hardwoods.

This map unit makes up about 40 percent of the county. It is about 50 percent Luverne soils, 25 percent Halso soils, and 25 percent soils of minor extent.

The very deep, well drained Luverne soils are on the higher ridgetops and on the lower parts of side slopes. The surface layer is brown sandy loam. The subsurface layer is light yellowish brown sandy loam. The subsoil is yellowish red clay and sandy clay in the upper part and yellowish red clay loam in the lower part. The substratum is thinly stratified, yellowish red sandy loam, light gray clay, and strong brown sandy clay loam.

The deep, moderately well drained Halso soils are on broad ridgetops at slightly lower elevations than the Luverne soils. The surface layer is brown silt loam. The subsoil is dark reddish brown clay in the upper part and red clay in the lower part. The substratum is light brownish gray clayey shale and light yellowish brown clay loam in the upper part and light brownish gray clayey shale in the lower part.

Of minor extent in this map unit are Arundel, Bibb, Malbis, and Orangeburg soils. Arundel soils are in landscape positions similar to those of the Halso soils. They are moderately deep over claystone bedrock. The poorly drained Bibb soils are on narrow flood plains. Malbis and Orangeburg soils are on the higher parts of ridgetops. They are loamy throughout the profile.

Most areas of this map unit are forested. Areas that are used for cultivated crops, pasture, or hay or as sites for homes are scattered throughout the map unit, mainly on the higher ridgetops.

The soils in this map unit are suited to cultivated crops and are well suited to pasture and hay. Low fertility, poor tilth, and the hazard of erosion are the main limitations. Applications of lime and fertilizer are needed for crops and pasture plants. Conservation tillage, terraces, grassed waterways, cover crops, and contour farming are management practices that are necessary to maintain productivity and control erosion.

The soils in this map unit are well suited to woodland. The potential productivity of loblolly pine and slash pine is very high. Common trees include sweetgum, water oak, loblolly pine, longleaf pine, and shortleaf pine. The low strength of the clayey subsoil restricts the use of equipment when the soils are wet. Erosion is a hazard along logging roads, landings, and skid trails.

The soils of this map unit are poorly suited to most urban uses. The main limitations are the very slow permeability and high shrink-swell potential in Halso soils and the moderately slow permeability and moderate shrink-swell potential in Luverne soils. In some areas, the slope is a limitation for some uses.

7. Orangeburg-Malbis

Nearly level to moderately sloping, well drained soils that have a loamy surface layer and a loamy subsoil; formed in loamy sediments

The landscape generally has slight to moderate relief in areas of this map unit. It is dominated by broad, nearly level to gently sloping ridgetops and gently sloping to moderately sloping side slopes on uplands. Narrow flood plains border incised, mostly intermittent streams. Slopes are generally long and smooth, and they range from 1 to 8 percent. The natural vegetation consists of pine and mixed hardwoods.

This map unit makes up about 13 percent of the county. It is about 75 percent Orangeburg soils, 10 percent Malbis soils, and 15 percent soils of minor extent.

Orangeburg soils are on the higher, more convex parts of broad ridgetops and on the upper parts of side slopes. The surface layer is dark brown and yellowish brown sandy loam. The subsoil is yellowish red sandy clay loam in the upper part and red sandy clay loam in the lower part.

Malbis soils are on slightly lower, less convex parts of broad ridgetops and on long, smooth side slopes. The surface layer is brown and yellowish brown fine sandy loam. The subsoil is yellowish brown sandy clay loam in the upper part; brownish yellow sandy clay loam that has reddish mottles and plinthite in the next part; and mottled brown, red, and light brownish gray sandy clay loam in the lower part.

Of minor extent in this map unit are Bibb, Iuka, Lucy, Luverne, and Troup soils. The poorly drained Bibb and moderately well drained Iuka soils are on narrow flood plains. Lucy and Troup soils are on the higher parts of narrow ridges, and they have thick sandy surface and subsurface layers. Luverne soils are on the lower parts of ridges and side slopes. They are clayey in the upper part of the subsoil.

Most areas of this map unit are used for cultivated crops, pasture, or hay. A significant acreage is forested or is used as sites for homes. Corn, cotton, soybeans, grain sorghum, and wheat are the main crops. Most of the forested areas in this unit are on the moderately sloping side slopes along drainageways and on narrow flood plains.

The soils in this map unit are suited to cultivated crops and are well suited to pasture and hay. Low fertility and the hazard of erosion are the main limitations. Applications of lime and fertilizer are needed for crops and pasture plants. Conservation tillage, terraces, grassed waterways, cover crops, and contour farming are management practices that help to maintain productivity and control erosion.

The soils in this map unit are well suited to woodland. The potential productivity of loblolly pine and slash pine is very high. Common trees include loblolly pine, longleaf pine, shortleaf pine, southern red oak, water oak, sweetgum, and hickory. The soils in this unit have few limitations for use as woodland; however, erosion is a concern along logging roads, landings, and skid trails.

The soils in this map unit are well suited to most urban uses. The moderate to moderately slow permeability is a limitation for some uses.

8. Greenville-Orangeburg-Lucedale

Nearly level to strongly sloping, well drained soils that have a loamy surface layer and a clayey or loamy subsoil; formed in clayey and loamy sediments

The landscape generally has slight to moderate relief in areas of this map unit. It consists of gently rolling uplands that have broad, convex ridgetops, gentle side slopes, and broad flats. It is dissected by a well-defined, branching drainage system. Slopes are long and smooth, and they range from 0 to 15 percent. The natural vegetation consists of mixed hardwoods and pine.

This map unit makes up about 6 percent of the county. It is about 58 percent Greenville soils, 15 percent Orangeburg soils, 9 percent Lucedale soils, and 18 percent soils of minor extent.

Greenville soils are on broad, nearly level ridgetops and on gently sloping to strongly sloping side slopes. The surface layer is dark reddish brown sandy loam. The subsoil is dark red clay.

Orangeburg soils are on slightly higher, narrow to broad, nearly level to gently sloping ridgetops and on gently sloping to moderately sloping side slopes. The surface layer is dark brown and yellowish brown sandy loam. The subsoil is yellowish red sandy clay loam in the upper part and red sandy clay loam in the lower part.

Lucedale soils are on broad, nearly level ridgetops. The surface layer is dark reddish brown sandy loam. The subsoil is dark red loam in the upper part and dark red sandy clay loam in the lower part.

Of minor extent in this map unit are Bibb, Iuka, Lucy, Luverne, Rains, and Troup soils. The poorly drained Bibb and moderately well drained Iuka soils are on narrow flood plains. Lucy and Troup soils are on higher parts of narrow ridges, and they have thick sandy surface and subsurface layers. Luverne soils are on the lower parts of ridges and side slopes. They are clayey in the upper part of the subsoil. The poorly drained Rains soils are in depressions on broad ridgetops.

Most areas of this map unit are used for cultivated crops, pasture, or hay. Scattered areas are used as sites for homes. Most of the forested areas in this unit are on the strongly sloping side slopes along drainageways and on narrow flood plains.

The soils in this map unit are well suited to cultivated crops, pasture, and hay. The low fertility and the hazard of erosion are the main limitations. Applications of lime and fertilizer are needed for crops and pasture plants. Conservation tillage, terraces, grassed waterways, cover crops, and contour farming are management practices that help to maintain productivity and control erosion.

The soils in this map unit are well suited to woodland. The potential productivity of loblolly pine and slash pine is high. Common trees include loblolly pine, longleaf pine, shortleaf pine, southern red oak, water oak, sweetgum, and hickory. The soils in this unit have few limitations for use as woodland.

The soils in this map unit are well suited to most urban uses. The slope is a limitation in some areas.

9. Bonneau-Eunola-Benndale

Nearly level to moderately sloping, well drained and moderately well drained soils that have a sandy or a loamy surface layer and a loamy subsoil; formed in sandy and loamy sediments

This map unit consists of soils on stream terraces that are parallel to Persimmon Creek and Pigeon Creek in the southern part of the county. The soils in this unit are subject to rare flooding or are not subject to flooding. The landscape generally has slight to moderate relief in areas of this map unit. It consists of broad flats and gentle side slopes. It is dissected by a well-defined, branching drainage system. Slopes are long and smooth, and they range from 0 to 8 percent.

This map unit makes up about 6 percent of the county. It is about 40 percent Bonneau soils, 25 percent Eunola soils, 10 percent Benndale soils, and 25 percent soils of minor extent.

The well drained Bonneau soils are on the higher parts of ridges and on side slopes. The surface layer is grayish brown loamy sand. The subsurface layer is brown and brownish yellow loamy sand. The subsoil is light olive brown and olive yellow sandy clay loam in the upper part and yellowish brown sandy clay loam in the lower part.

The moderately well drained Eunola soils are on low terraces and are subject to rare flooding. The surface layer is brown sandy loam. The subsoil is yellowish brown sandy clay loam in the upper part, yellowish brown sandy clay loam that has light brownish gray and yellowish red mottles in the next part, and yellowish brown sandy loam in the lower part. The substratum is yellowish brown sand.

The well drained Benndale soils are on nearly level to gently sloping, broad ridgetops. The surface layer is dark brown sandy loam. The subsoil is yellowish brown sandy loam in the upper part and brownish yellow sandy loam in the lower part.

Of minor extent in this map unit are Bibb, Cahaba, Lynchburg, and Rains soils. The poorly drained Bibb soils are on narrow flood plains. The well drained Cahaba soils are in slightly higher, more convex positions on low terraces than the Eunola soils. The somewhat poorly drained Lynchburg and poorly drained Rains soils are in slightly lower, less convex positions than the Bonneau, Benndale, or Eunola soils.

Most areas of this unit are used for cultivated crops, pasture, or hay. Forested areas are scattered throughout the map unit, mainly on the steeper slopes adjacent to drainageways and on narrow flood plains.

The soils in this map unit are well suited to cultivated crops, pasture, and hay. The main limitations are the low fertility, the droughtiness of the Bonneau soils, and the wetness of the Eunola soils. Erosion is a hazard in the sloping areas. Applications of lime and fertilizer are needed for crops and pasture. Conservation tillage, grassed waterways, contour farming, and cover crops are management practices that minimize soil losses from erosion.

The soils in this map unit are well suited to woodland. The potential production of loblolly pine and slash pine is very high. Common trees include loblolly pine, longleaf pine, shortleaf pine, yellow poplar, sweetgum, and water oak. The sandy texture of Bonneau soils hinders the use of wheeled equipment, especially when the soils are very dry. Soil droughtiness increases the seedling mortality rate in areas of Bonneau soils.

The soils in this map unit are generally suited to most urban uses. Flooding is a limitation for most uses in areas of Eunola soils. The seasonal high water table in the Bonneau and Eunola soils is a limitation for some uses.

Detailed Soil Map Units

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

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

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit 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, 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, slope, stoniness, salinity, 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, Greenville sandy loam, 1 to 3 percent slopes, is a phase of the Greenville series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Demopolis-Brantley complex, 15 to 35 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Mantachie, Bibb, and Iuka soils, 0 to 1 percent slopes, frequently flooded, is an undifferentiated group in this survey area.

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

Table 5 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 or miscellaneous areas.

AaB—Alaga-Troup complex, 0 to 5 percent slopes

These very deep, somewhat excessively drained soils are on broad ridgetops and on the upper parts of side slopes in the uplands. The two soils occur as areas so closely intermingled that it was not possible to separate them at the scale selected for mapping. The mapped areas consist of about 55 percent Alaga soil and 35 percent Troup soil. Slopes generally are long and smooth. They vary in length from 100 to 550 feet. Individual areas are irregular in shape and range from 5 to more than 300 acres in size.

Typically, the Alaga soil has a surface layer of dark brown loamy sand about 6 inches thick. The substratum, to a depth of 96 inches, is strong brown loamy sand.

Important properties of the Alaga soil—

Permeability: Rapid
Available water capacity: Low
Organic matter content: Low
Natural fertility: Very low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Typically, the Troup soil has a surface layer of brown loamy sand about 4 inches thick. The subsurface layer, to a depth of 62 inches, is strong brown and reddish yellow loamy sand. The subsoil, to a depth of 80 inches, is yellowish red sandy clay loam.

Important properties of the Troup soil—

Permeability: Rapid in the surface layer and subsurface layer; moderate in the subsoil
Available water capacity: Low
Organic matter content: Low
Natural fertility: Very low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Greenville, Lucedale, Lucy, and Orangeburg soils. Greenville, Lucedale, and Orangeburg soils are in slightly higher landscape positions than the Alaga and Troup soils. They do not have thick sandy surface and subsurface layers. Additionally, the Greenville soils have a dark red, clayey subsoil. Lucy soils are in landscape positions similar to those of the Troup and Alaga soils. Lucy soils have a loamy subsoil within a depth of 40 inches. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this map unit are used for hay, pasture, or woodland.

This map unit is suited to cultivated crops. The main limitations are the low available water capacity, the low fertility, and the moderate hazard of erosion. Irrigation can prevent crop damage and increase productivity in most years. Returning crop residue to the soil helps to maintain tilth and increases the water-holding capacity. Minimum tillage, contour farming, and cover crops reduce the runoff rate and help to control erosion. Most crops respond well to applications of lime and frequent, light applications of fertilizer.

These soils are well suited to pasture and hay. Coastal bermudagrass and bahiagrass are well suited to these soils. The main limitations are the low fertility and the low available water capacity. The leaching of plant nutrients is a management concern. Frequent, light applications of nitrogen are necessary to maintain the productivity of grasses. Proper stocking rates, pasture rotation, and restricted grazing during prolonged dry periods help to keep the pasture in good condition.

These soils are suited to loblolly pine and slash pine. Other species that commonly grow in areas of these soils include longleaf pine, shortleaf pine, and southern red oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 80 for both the Alaga and Troup soils. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 1.8 cords per acre per year. The understory vegetation consists mainly of little bluestem, longleaf uniola, lespedeza, common persimmon, prickly pear cactus, bracken fern, flowering dogwood, and blackjack oak.

These soils have moderate limitations for the management of timber. The main limitations are the restricted use of equipment, the seedling mortality rate, and plant competition. The sandy texture restricts the use of wheeled equipment, especially when the soils are very dry. Harvesting activities should be planned during seasons of the year when the soils are moist. The moderate seedling mortality rate is caused by droughtiness. It can be compensated for by increasing the tree planting rate. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation. The competing vegetation can be controlled by mechanical methods, herbicides, or prescribed fire.

These soils are suited to most urban uses. They have slight limitations for building sites and local roads and streets and have slight to severe limitations for most kinds of sanitary facilities. The main limitations are the sandy texture, seepage, low fertility, and droughtiness. Cutbanks are unstable and are subject to slumping. Support beams should be used to maintain the stability of the cutbanks. If septic tank filter fields are used, effluent can surface in downslope areas and create a hazard to health. Increasing the length of the absorption lines and constructing the lines on the contour will help to overcome this concern. Applying lime and fertilizer, mulching, and irrigating help to establish lawns and landscape plants.

This map unit has fair potential as habitat for openland wildlife, poor potential as habitat for woodland wildlife, and very poor potential as habitat for wetland wildlife. The low available water capacity and the very low natural fertility are limitations for improving the potential as habitat for wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

The Alaga and Troup soils are in capability subclass IIIs. The woodland ordination symbol is 8S.

ArC—Arundel fine sandy loam, 5 to 8 percent slopes

This moderately deep, well drained soil is on narrow ridgetops and on side slopes of the uplands. Slopes generally are short and complex. They vary in length from 75 to 200 feet. Individual areas are generally irregular in shape and range from 5 to more than 200 acres in size.

Typically, the surface layer is brown fine sandy loam about 3 inches thick. The subsoil, to a depth of 23 inches, is yellowish red sandy clay loam and clay in the upper part and strong brown clay and clay loam in the lower part. The substratum, to a depth of 60 inches, is weathered claystone.

Important properties of the Arundel soil—

Permeability: Very slow
Available water capacity: Low
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: High
Flooding: None

Included in mapping are a few small areas of Halso, Luverne, and Orangeburg soils. Also included, generally on points of ridges, are areas that have many stones, boulders, and cobbles on the surface. Halso soils are in landscape positions similar to those of the Arundel soil. They have soft bedrock at a depth of 40 to 60 inches. Luverne soils are in slightly higher landscape positions than the Arundel soil. They do not have bedrock within a depth of 80 inches. Orangeburg soils are in higher landscape positions than the Arundel soil. They have a loamy subsoil. Included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this map unit are used for woodland. A few small areas are used for pasture and hay.

This soil is poorly suited to cultivated crops. The main limitations are the short, complex slopes, the low fertility, and the severe hazard of erosion. In some areas, large boulders may limit the use of equipment. Measures that control erosion include early fall seeding, minimum tillage, terraces, diversions, and grassed waterways. Tillage should be on the contour or across the slope. Most crops respond well to systematic applications of fertilizers and lime.

This soil is suited to pasture and hay. The main management concerns are the low fertility and the severe hazard of erosion. The seedbed should be prepared on the contour or across the slope if practical. Applications of lime and fertilizer improve fertility and increase the production of forage. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include shortleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 80. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 1.8 cords per acre per year. The understory vegetation consists mainly of greenbrier, longleaf uniola, little bluestem, lespedeza, panicums, huckleberry, and flowering dogwood.

This soil generally has moderate limitations for the management of timber. The main limitations are the restricted use of equipment and plant competition. The low strength restricts the use of equipment to periods when the soil is dry. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Using low-pressure ground equipment reduces damage to the soil and helps to maintain productivity. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial plant competition, and herbicides can be used to control the subsequent growth.

This soil is poorly suited to most urban uses. It has moderate to severe limitations for building sites and has severe limitations for local roads and streets and most kinds of sanitary facilities. The main limitations are the very slow permeability, the depth to rock, the high shrink-swell potential, and the low strength on sites for roads and streets. Properly designing foundations and footings and diverting runoff away from the buildings help to prevent the structural damage that results from shrinking and swelling. Septic tank absorption fields will not function during rainy periods because of the very slow permeability. An alternate system of sewage disposal should be used to dispose of sewage properly.

This map unit has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Arundel soil is in capability subclass IVe. The woodland ordination symbol is 8C.

ArF—Arundel fine sandy loam, 8 to 35 percent slopes

This moderately deep, well drained soil is on hillsides of the uplands. Slopes are generally short and complex. They range in length from 35 to 150 feet. Individual areas are generally narrow and irregular in shape. They range from 50 to more than 400 acres in size.

Typically, the surface layer is brown fine sandy loam about 6 inches thick. The subsoil, to a depth of 24 inches, is yellowish brown clay loam and strong brown clay in the upper part and dark yellowish brown clay in the lower part. The substratum, to a depth of 60 inches, is weathered claystone. It can be excavated with difficulty with hand tools and is rippable by light machinery.

Important properties of the Arundel soil—

Permeability: Very slow
Available water capacity: Low
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: High
Flooding: None

Included in mapping are a few small areas of Halso and Luverne soils. Also included are areas of rock outcrop and small areas that have many stones, boulders, and cobbles on the surface. Halso and Luverne soils are in landscape positions similar to those of the Arundel soil. Halso soils have shale bedrock at a depth of 40 to 60 inches. Luverne soils do not have bedrock within a depth of 80 inches. Included soils make up about 20 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used as woodland.

This soil is not suited to cultivated crops, mainly because the slopes are too steep and the hazard of erosion is too severe. The irregular slope, the low fertility, and scattered areas of rock outcrop are additional limitations.

This soil is poorly suited to pasture and hay. The main limitations are the slope, the low fertility, and the severe hazard of erosion. The steeper areas are best suited to native grasses. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This soil is suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include shortleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 80. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 1.8 cords per acre per year. The understory vegetation consists mainly of greenbrier, little bluestem, longleaf uniola, panicums, lespedeza, southern waxmyrtle, huckleberrry, and flowering dogwood.

This map unit has moderate limitations for the management of timber. The main limitations are the hazard of erosion, the equipment limitation, the seedling mortality rate, and plant competition. Exposing the surface by removing ground cover increases the hazard of erosion, and exposed soil surfaces are subject to rill and gully erosion. Roads, landings, and skid trails can be protected against erosion by constructing diversions, mulching, and seeding. The slope restricts the use of equipment. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Cable yarding systems are safer and damage the soil less. The moderate seedling mortality rate can be compensated for by increasing the number of trees planted. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial plant competition, and herbicides can be used to control the subsequent growth.

This soil is poorly suited to most urban uses. It has severe limitations for building sites, most kinds of sanitary facilities, and local roads and streets. The main limitations are the slope, the depth to bedrock, the high shrink-swell potential, the very slow permeability, and low strength if used for roads and streets. Erosion is a hazard in the steeper areas. Only the part of the site that is used for construction should be disturbed. Access roads can be designed so that surface runoff is controlled and cut slopes are stabilized. Alternative methods of sewage disposal should be used.

This map unit has fair potential as habitat for openland wildlife, good potential as habitat for woodland wildlife, and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Arundel soil is in capability subclass VIIe. The woodland ordination symbol is 8R.

BeB—Benndale sandy loam, 1 to 5 percent slopes

This very deep, well drained soil is on broad ridgetops and terraces of the uplands. Slopes are generally long and smooth. They range in length from 100 to 450 feet. Individual areas are oblong in shape. They range from 5 to 150 acres in size.

Typically, the surface layer is dark brown sandy loam about 12 inches thick. The subsoil, to a depth of 66 inches, is yellowish brown sandy loam in the upper part and brownish yellow sandy loam in the lower part.

Important properties of the Benndale soil—

Permeability: Moderate
Available water capacity: Moderate
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Bonneau, Malbis, and Orangeburg soils. Bonneau and Malbis soils are in landscape positions similar to those of the Benndale soil. Bonneau soils have thick sandy surface and subsurface layers. Malbis soils are fine-loamy and have significant accumulations of plinthite in the lower part of the subsoil. Orangeburg soils are on slightly higher knolls or on more convex slopes. They have a reddish subsoil. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for cultivated crops, pasture, or hay. A few areas are used as sites for homes, and a few areas are wooded.

This soil is well suited to cultivated crops. It has few limitations for this use; however, erosion is a hazard in the more sloping areas. Tillage should be on the contour or across the slope. Maintaining crop residue on or near the surface helps to control runoff and maintains tilth and the content of organic matter. Most crops respond well to systematic applications of lime and fertilizer.

This soil is well suited to pasture and hay, and it has few limitations for these uses. Grasses such as coastal bermudagrass or bahiagrass are well suited. Applications of lime and fertilizer improve fertility and increase the production of forage and hay. Proper stocking rates, pasture rotation, and restricted grazing during prolonged wet and dry periods help to keep the pasture in good condition.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 95. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.5 cords per acre per year. The understory vegetation consists mainly of blackberry, muscadine grape, little bluestem, common persimmon, greenbrier, huckleberry, flowering dogwood, oak, and hickory.

This soil has few limitations affecting the production of timber. Soil compaction and plant competition are minor management concerns. Harvesting during the drier periods helps to prevent compaction. Using proper site preparation and spraying, cutting, or girdling can eliminate unwanted weeds, brush, and trees.

This soil is well suited to most urban uses. It has no significant limitations for most uses.

This soil has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat for woodland wildlife can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Benndale soil is in capability subclass IIe. The woodland ordination symbol is 10A.

BgB—Bigbee loamy sand, 0 to 3 percent slopes, rarely flooded

This very deep, excessively drained soil is on low stream terraces that are parallel to large streams throughout the county. Flooding is rare, but it can occur under unusual weather conditions. Slopes are generally long and smooth. They range in length from 50 to 400 feet. Individual areas are oblong. They range from 10 to 150 acres in size.

Typically, the surface layer is dark yellowish brown loamy sand about 10 inches thick. The substratum, to a depth of 80 inches, is dark yellowish brown loamy sand in the upper part, strong brown loamy sand in the next part, and very pale brown and brownish yellow sand in the lower part.

Important properties of the Bigbee soil—

Permeability: Rapid
Available water capacity: Low
Organic matter content: Low
Natural fertility: Very low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Apparent, at a depth of 3.5 to 6.0 feet from December through April
Shrink-swell potential: Low
Flooding: Rare

Included in mapping are a few small areas of Bethera, Bibb, Cahaba, Iuka, and Mantachie soils. The poorly drained Bethera and Bibb soils are in depressional areas. Cahaba soils are in landscape positions similar to those of the Bigbee soil. They have a loamy subsoil. The moderately well drained Iuka and somewhat poorly drained Mantachie soils are on narrow flood plains. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for cultivated crops, pasture, or hay. A few areas are wooded.

This soil is suited to cultivated crops. The low fertility and the low available water capacity are the main limitations. If this soil is used for row crops, conservation tillage, crop rotation, and cover crops help to conserve moisture and control runoff and erosion. Irrigation can prevent crop damage and increase productivity in most years. Using minimum tillage and returning all crop residue to the soil or regularly adding other organic matter improve fertility and help to conserve moisture and maintain tilth and the content of organic matter. Crops respond well to applications of lime and frequent, light applications of fertilizer.

This soil is well suited to pasture and hay. Droughtiness is the main limitation. Bahiagrass and coastal bermudagrass are well suited to this soil. The leaching of plant nutrients is a management concern. Split applications of nitrogen fertilizer are recommended to maintain the productivity of grasses. Proper stocking rates, pasture rotation, and restricted grazing during prolonged dry periods help to keep the pasture in good condition.

This soil is suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.1 cords per acre per year. The understory vegetation consists mainly of huckleberry, greenbrier, blackberry, prickly pear cactus, common persimmon, blackjack oak, and water oak.

This soil has moderate limitations for the management of timber. The main limitations are the restricted use of equipment and the seedling mortality rate. The sandy texture of the surface layer restricts the use of wheeled equipment, especially when the soil is very dry. Harvesting activities should be planned during seasons of the year when the soil is moist. The moderate seedling mortality rate is caused by droughtiness. It can be compensated for by increasing the number of trees planted.

This soil is poorly suited to most urban uses. It has severe limitations for building sites and most kinds of sanitary facilities and has moderate limitations for local roads and streets. The main limitations are the sandy texture, seepage, wetness, and the hazard of flooding. If buildings are constructed in areas of this unit, they should be placed on pilings or on well compacted fill above the expected flood level. Septic tank absorption fields may not function properly during rainy periods because of the seasonal high water table. Increasing the size of the absorption field or constructing the absorption field on a raised bed helps to overcome this limitation.

This soil has fair potential as habitat for openland wildlife, poor potential as habitat for woodland wildlife, and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Bigbee soil is in capability subclass IIIs. The woodland ordination symbol is 9S.

BoB—Bonneau loamy sand, 0 to 5 percent slopes

This very deep, well drained soil is on broad ridgetops and terraces of the uplands. Slopes are long and smooth. They range in length from 100 to 450 feet. Individual areas are oblong to irregular in shape. They range from 5 to 150 acres in size.

Typically, the surface layer is grayish brown loamy sand about 6 inches thick. The subsurface layer, to a depth of 23 inches, is brown and brownish yellow loamy sand. The subsoil, to a depth of 72 inches, is light olive brown and olive yellow sandy clay loam in the upper part and yellowish brown sandy clay loam in the lower part.

Important properties of the Bonneau soil—

Permeability: Rapid in the surface layer and subsurface layer; moderate in the subsoil
Available water capacity: Low
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Perched, at a depth of 3.5 to 5.0 feet from December through March
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Benndale and Malbis soils. Benndale soils are in landscape positions similar to those of the Bonneau soil. They do not have a thick sandy surface layer. Malbis soils are in slightly higher landscape positions. They do not have thick sandy surface layers. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for cultivated crops or woodland. Some areas are used for pasture, hay, or as sites for homes.

This soil is well suited to most cultivated crops. The main limitations are the low available water capacity and the low fertility. Conservation tillage, cover crops in winter, a crop residue management system, and a crop rotation system that includes grasses and legumes increase the available water, decrease crusting, and improve soil fertility. Using supplemental irrigation and selecting crop varieties that are adapted to droughty conditions increase the production of crops. Most crops respond well to applications of lime and frequent, light applications of fertilizer.

This soil is well suited to pasture and hay. The main limitations are the low available water capacity and the low fertility. Drought-tolerant grasses, such as bahiagrass and coastal bermudagrass, are well suited. The leaching of plant nutrients is a management concern. Split applications of nitrogen fertilizer are recommended to maintain the productivity of grasses. Proper stocking rates, pasture rotation, and restricted grazing during prolonged dry periods help to keep the pasture in good condition.

This soil is well suited to loblolly pine and slash pine (fig. 2). Other species that commonly grow in areas of this soil include longleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of greenbrier, bracken fern, poison oak, flowering dogwood, common persimmon, blackjack oak, and little bluestem.

This soil has moderate limitations for the management of timber. The main limitations are the restricted use of equipment, the seedling mortality rate, and plant competition. The sandy texture of the surface layer restricts the use of wheeled equipment, especially when the soil is very dry. Harvesting activities should be planned during seasons of the year when the soil is moist. The moderate seedling mortality rate can be compensated for by increasing the number of trees planted. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation. The competing vegetation can be controlled by site preparation, herbicides, or prescribed fire.

This soil is suited to most urban uses. The main limitations are the moderate permeability and droughtiness. Applying lime and fertilizer, mulching, and irrigating help to establish lawns and landscape plants. Septic tank absorption fields may not function properly during rainy periods because of the moderate permeability. Enlarging the size of the absorption field helps to compensate for this limitation.

This soil has good potential as habitat for openland wildlife, fair potential as habitat for woodland wildlife, and very poor potential as habitat for wetland wildlife. The low available water capacity and the low natural fertility are limitations for improving the potential as habitat for wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Bonneau soil is in capability subclass IIs. The woodland ordination symbol is 9S.

BoC—Bonneau loamy sand, 5 to 8 percent slopes

This very deep, well drained soil is on side slopes of ridges and terraces in the uplands. Slopes are generally short and complex, but they may be long and smooth in some areas. Individual areas are generally long and narrow. They range from 10 to 150 acres in size.

Typically, the surface layer is grayish brown loamy sand about 8 inches thick. The subsurface layer, to a depth of 26 inches, is light yellowish brown loamy sand in the upper part and light yellowish brown sand in the lower part. The

Figure 2.—Trees grown in an area of Bonneau loamy sand, 0 to 5 percent slopes, respond well to timber stand improvement practices.

subsoil, to a depth of 72 inches, is yellowish brown sandy clay loam.

Important properties of the Bonneau soil—

Permeability: Rapid in the surface layer and subsurface layer; moderate in the subsoil
Available water capacity: Low
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Perched, at a depth of 3.5 to 5.0 feet from December through March
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Benndale, Lynchburg, and Malbis soils. Benndale and Malbis soils are in higher landscape positions. They do not have thick sandy surface and subsurface layers. The somewhat poorly drained Lynchburg soils are in lower landscape positions. They do not have thick sandy surface and subsurface layers. Included soils make up about 15 percent of the map unit, but individual areas generally are less than 5 acres in size.

Most areas of this soil are used for pasture, hay, and woodland. A few areas are used for cultivated crops.

This soil is suited to most cultivated crops. The low available water capacity, the low fertility, and the hazard of erosion are the main limitations. Conservation tillage, contour farming, and cover crops reduce the runoff rate and help to control erosion. Returning all crop residue to the soil helps to maintain tilth and increases the water-holding capacity. Irrigation can prevent crop damage and increase productivity in most years. Most crops respond well to applications of lime and frequent, light applications of fertilizer.

This soil is well suited to pasture and hay. Coastal bermudagrass and bahiagrass are well suited to this soil. The main limitations are the low fertility, the low available water capacity, and the hazard of erosion. The leaching of plant nutrients is a management concern. Frequent, light applications of nitrogen are necessary to maintain the productivity of grasses. Tillage should be on the contour or across the slope. Proper stocking rates, pasture rotation, and restricted grazing during prolonged dry periods help to keep the pasture in good condition.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of little bluestem, bracken fern, panicums, greenbrier, common persimmon, blackjack oak, and flowering dogwood.

This soil has moderate limitations for the management of timber. The main limitations are the restricted use of equipment, the seedling mortality rate, and plant competition. The sandy texture of the surface layer restricts the use of wheeled equipment, especially when the soil is very dry. Harvesting activities should be planned during seasons of the year when the soil is moist. The moderate seedling mortality rate can be compensated for by increasing the number of trees planted. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation. The competing vegetation can be controlled by mechanical methods, herbicides, or prescribed fire. Exposing the surface by removing ground cover increases the hazard of erosion. Roads, landings, and skid trails can be protected against erosion by constructing diversions, mulching, and seeding.

This soil is suited to most urban uses. The thick sandy surface layer, the low fertility, droughtiness, and the moderate permeability are the main management concerns. Applying lime and fertilizer, mulching, and irrigating help to establish lawns and landscape plants. Septic tank absorption fields may not function properly during rainy periods because of the moderate permeability. Enlarging the size of the absorption field helps to compensate for this limitation. The hazard of erosion is also a concern. Only the part of the site that is used for construction should be disturbed. Access roads can be designed so that surface runoff is controlled and cut slopes are stabilized.

This map unit has good potential as habitat for openland wildlife, fair potential as habitat for woodland wildlife, and very poor potential as habitat for wetland wildlife. The low available water capacity and the low natural fertility are limitations for improving the potential as habitat for wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Bonneau soil is in capability subclass IIIs. The woodland ordination symbol is 9S.

CaA—Cahaba fine sandy loam, 0 to 2 percent slopes, rarely flooded

This very deep, well drained soil is on low terraces that are parallel to the rivers and large streams throughout the county. Flooding is rare, but it can occur under unusual weather conditions. Slopes are generally long and smooth. Individual areas are oblong in shape. They range from 5 to 100 acres in size.

Typically, the surface layer is dark grayish brown fine sandy loam about 10 inches thick. The subsurface layer, to a depth of 18 inches, is yellowish brown fine sandy loam. The subsoil, to a depth of 48 inches, is yellowish red sandy clay loam. The substratum, to a depth of 60 inches, is yellowish red fine sandy loam.

Important properties of the Cahaba soil—

Permeability: Moderate in the upper part of the subsoil; moderately rapid in the lower part
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: Rare

Included in mapping are a few small areas of Bonneau, Eunola, Lynchburg, and Bibb soils. Bonneau soils are on slightly higher knolls and have thick sandy surface and subsurface layers. The moderately well drained Eunola soils and the somewhat poorly drained Lynchburg soils are in slightly lower, more concave landscape positions.

They have a brownish subsoil. The poorly drained Bibb soils are on narrow flood plains and in small depressions. Included soils make up about 10 percent of the map unit, but individual areas generally are less than 5 acres in size.

Most areas of this map unit are used for pasture, hay, and woodland. A few areas are used for cultivated crops, and some areas are used as sites for homes.

This soil is well suited to cultivated crops. There are few limitations for this use; however, low fertility is a concern. Using minimum tillage and returning all crop residue to the soil or regularly adding other organic matter improve fertility and help to maintain tilth and the content of organic matter. Most crops respond well to applications of lime and fertilizer.

This soil is well suited to pasture and hay. There are few limitations for these uses. Grasses such as coastal bermudagrass and bahiagrass are well suited. Proper stocking rates, pasture rotation, and restricted grazing during prolonged wet and dry periods help to keep the pasture in good condition. Applications of lime and fertilizer improve soil fertility and promote the good growth of forage plants.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, yellow poplar, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of greenbrier, little bluestem, panicums, American holly, longleaf uniola, sweetgum, and flowering dogwood.

This soil has few limitations affecting woodland management; however, competition from understory plants is a minor management concern. Carefully managed reforestation helps to control competition from undesirable understory plants. Site preparation practices, such as chopping, burning, and applying herbicides, help to control the initial plant competition and facilitate mechanical planting.

This soil is poorly suited to most urban uses. The hazard of flooding is a severe limitation that is difficult to overcome. If this soil is used as a homesite, the building should be constructed on elevated, well-compacted fill material to minimize damage from flood water.

This soil has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Cahaba soil is in capability class I. The woodland ordination symbol is 9A.

CoA—Congaree loam, 0 to 1 percent slopes, frequently flooded

This very deep, moderately well drained soil is on flood plains along streams in the northwest corner of the county. It is subject to flooding for brief periods several times each year, usually in winter and spring. Individual areas are generally long and narrow. They range from 10 to 200 acres in size.

Typically, the surface layer is dark brown loam about 8 inches thick. The substratum, to a depth of 65 inches, is dark yellowish brown loam in the upper part; brown and dark yellowish brown fine sandy loam in the next part; and brown loamy sand in the lower part. Thin strata of coarser or finer textured material are throughout the profile.

Important properties of the Congaree soil—

Permeability: Moderate
Available water capacity: High
Organic matter content: Medium
Natural fertility: Medium
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Apparent, at a depth of 2.5 to 4.0 feet from December through April
Shrink-swell potential: Low
Flooding: Frequent

Included in mapping are a few small areas of Bibb, Leeper, and Mantachie soils. The poorly drained Bibb soils are in depressions. The somewhat poorly drained Leeper and Mantachie soils are in slightly lower landscape positions than the Congaree soil. Leeper soils are clayey throughout the profile. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for woodland and pasture. A few areas are used for cultivated crops or hay.

This soil is suited to cultivated crops. The main limitation is the hazard of flooding. Flooding occurs mainly in late winter and early spring, but it can occur throughout the year. Although crops can be grown in most years, flooding delays planting or damages crops in some years. Crops and drainage ditches may be damaged or destroyed due to scouring and deposition by fast-flowing flood waters.

This soil is suited to pasture and hay. The main management concern is the frequent flooding. Cattle or other livestock must be moved to higher areas during flood periods. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This soil is well suited to loblolly pine, slash pine, and hardwood species. Other species that commonly grow in areas of this soil include sweetgum, yellow-poplar, American sycamore, green ash, hackberry, water oak, and eastern cottonwood. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of carpetgrass, longleaf uniola, blackberry, green ash, sweetgum, dwarf palmetto, panicums, red maple, and Alabama supplejack.

This soil has moderate limitations for the management of timber. The main limitations are the restricted use of equipment and the plant competition. The seasonal high water table and the flooding restrict the use of equipment to periods when the soil is dry. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Using low-pressure ground equipment reduces damage to the soil and helps to maintain productivity. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial plant competition, and herbicides can be used to control subsequent growth.

This soil is not suited to most urban uses. The major limitation is the frequent flooding. Although it is generally not feasible to control flooding, buildings can be placed on pilings or well-compacted fill to elevate them above the expected flood level.

This map unit has good potential as habitat for openland and woodland wildlife and fair potential as habitat for wetland wildlife. Habitat for openland and woodland wildlife can be improved by planting or encouraging the growth of existing oak trees and suitable understory plants. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

This Congaree soil is in capability subclass IIIw. The woodland ordination symbol is 9A.

DbF—Demopolis-Brantley complex, 15 to 35 percent slopes

This map unit consists of the shallow, well drained Demopolis soil and the very deep, well drained Brantley soil. It is on side slopes and narrow ridges in the northwest corner of the county. The soils occur as areas so intricately intermingled that they could not be mapped separately at the scale selected for mapping. The Demopolis soil makes up about 50 percent of the map unit, and the Brantley soil makes up about 30 percent. Slopes are generally short and complex. They range from 50 to 150 feet in length. Individual areas are irregular in shape. They range from 10 to 250 acres in size.

The Demopolis soil is on the upper parts of slopes, crests of narrow ridges, and on benches. Typically, the surface layer is very dark grayish brown loam about 4 inches thick. The substratum is pale olive silty clay loam to a depth of 10 inches. The next layer, to a depth of 60 inches, is soft limestone bedrock.

Important properties of the Demopolis soil—

Permeability: Very slow
Available water capacity: Low
Organic matter content: Medium
Natural fertility: Medium
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

The Brantley soil is generally on the lower parts of slopes. Typically, the surface layer is dark grayish brown loam about 3 inches thick. The subsoil, to a depth of 56 inches, is strong brown and dark yellowish brown clay in the upper part and yellowish brown sandy clay loam in the lower part. The substratum, to a depth of 72 inches, is yellowish brown fine sandy loam.

Important properties of the Brantley soil—

Permeability: Slow
Available water capacity: High
Organic matter content: Medium
Natural fertility: Medium
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Moderate
Flooding: None

Included in mapping are a few small areas of Oktibbeha, Searcy, Sumter, and Watsonia soils. Also included are small areas of limestone rock outcrop and soils that have a cobbly or stony surface layer. Oktibbeha and Searcy soils are in landscape positions similar to those of the Brantley soil. Oktibbeha soils have vertic properties. Searcy soils are moderately well drained and have a thicker solum than the Brantley soil. Sumter and Watsonia soils are in landscape positions similar to those of the Demopolis soil. Sumter soils are moderately deep over limestone bedrock. Watsonia soils are shallow over bedrock. They are acid in the upper part of the subsoil. Included soils make up about 20 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this map unit are used as woodland and wildlife habitat. A few small areas are used as pasture.

This map unit is unsuited to cultivated crops. The complex topography and the strongly sloping to steep slopes are severe limitations for the use of equipment. Erosion is a severe hazard. The shallow depth of the Demopolis soil is an additional limitation.

This map unit is poorly suited to pasture and hay. The steep, complex slopes and the severe hazard of erosion are the main limitations. The seedbed should be prepared on the contour or across the slope if practical.

Areas of Demopolis soils are suited to eastern redcedar. Demopolis soils are not suited to pine trees because they are alkaline to the surface. On the basis of a 50-year curve, the mean site index for eastern redcedar is 40. The average annual growth of well stocked, even-aged, unmanaged stands of eastern redcedar at 40 years of age is 140 board feet per acre per year. Areas of the Brantley soil are well suited to loblolly pine and slash pine. On the basis of a 50-year site curve, the mean site index is 85 for loblolly pine. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.1 cords per acre per year. The understory vegetation consists mainly of greenbrier, poison ivy, hackberry, honeylocust, Macartney rose, panicums, blackberry, and winged elm.

This map unit has moderate limitations for the management of timber. The main limitations are the hazard of erosion, the equipment limitation, the seedling mortality rate, and plant competition. Exposing the surface by removing ground cover increases the hazard of erosion, and exposed soil surfaces are subject to rill and gully erosion. Roads, landings, and skid trails can be protected against erosion by constructing diversions, mulching, and seeding. The slope restricts the use of equipment. Using standard wheeled and tracked equipment results in rutting and increases the hazard of erosion. Cable yarding systems are safer and damage the soil less. The high seedling mortality rate in areas of the Demopolis soil is caused by droughtiness. It can be compensated for by increasing the number of trees planted. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation. The competing vegetation can be controlled by mechanical methods, herbicides, or prescribed fire.

This map unit is poorly suited to most urban uses. The soils have severe limitations for building sites, local roads and streets, and for most kinds of sanitary facilities. The main limitations are the slope, the slow to very slow permeability, and the shallow depth to rock in areas of the Demopolis soil. Erosion is a severe hazard in the steeper areas.

This map unit has poor potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

The Demopolis and Brantley soils are in capability subclass VIIe. The woodland ordination symbol is 3R for the Demopolis soil and 8R for the Brantley soil.

DwD—Demopolis-Watsonia complex, 2 to 8 percent slopes

This map unit consists of the shallow, well drained Demopolis and Watsonia soils. It is on narrow ridgetops and side slopes in the northwest corner of the county. The soils occur as areas so intricately intermingled that they could not be mapped separately at the scale selected for mapping. The Demopolis soil makes up about 65 percent of the map unit, and the Watsonia soil makes up about 20 percent. Slopes are generally short and complex. They range from 35 to 100 feet in length. Individual areas are irregular in shape. They range from 10 to more than 100 acres in size.

The Demopolis soil is on the more convex parts of ridgetops and on the upper parts of side slopes. Typically, the surface layer is dark grayish brown loam about 4 inches thick. The substratum, to a depth of 10 inches, is dark grayish brown loam that has many fragments of soft limestone and concretions of calcium carbonate. The next layer, to a depth of 60 inches, is soft limestone bedrock.

Important properties of the Demopolis soil—

Permeability: Very slow
Available water capacity: Low
Organic matter content: Medium
Natural fertility: Medium
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

The Watsonia soil is on the smoother, less convex parts of ridgetops. Typically, the surface layer is brown clay about 4 inches thick. The subsoil, to a depth of 19 inches, is yellowish red clay in the upper part, yellowish brown clay in the next part, and light olive brown clay in the lower part.

The substratum, to a depth of 60 inches, is soft limestone bedrock.

Important properties of the Watsonia soil—

Permeability: Very slow
Available water capacity: Low
Organic matter content: Medium
Natural fertility: Medium
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: High
Flooding: None

Included in mapping are a few small areas of Brantley, Oktibbeha, and Sumter soils. Also included are areas of rock outcrop and areas of soils that have a cobbly or stony surface layer. Brantley and Oktibbeha soils are on lower parts of slopes. They are acid in the upper part of the subsoil and do not have bedrock within a depth of 60 inches. Sumter soils are in landscape positions similar to those of the Demopolis soil. They have limestone bedrock at a depth of 20 to 40 inches. Included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this map unit are used as woodland and wildlife habitat. A few small areas are used as pasture.

This map unit is not suited to cultivated crops. The main limitations are the low available water capacity, the shallow depth to bedrock, poor tilth, and the severe hazard of erosion.

This map unit is poorly suited to pasture and hay. The droughtiness and the severe hazard of erosion are the main limitations. Proper stocking rates, pasture rotation, and restricted grazing during prolonged wet periods help to keep the soil in good condition.

Areas of the Demopolis soil are suited to eastern redcedar. The Demopolis soil is not suited to pine trees because it is alkaline to the surface. On the basis of a 50-year curve, the mean site index for eastern redcedar is 40. The average annual growth of well stocked, even-aged, unmanaged stands of eastern redcedar at 40 years of age is 140 board feet per acre per year. Areas of the Watsonia soil are suited to loblolly pine. On the basis of a 50-year site curve, the mean site index is 75 for loblolly pine. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 1.6 cords per acre per year. The understory vegetation consists mainly of greenbrier, panicums, broomsedge, bluestem, Macartney rose, blackberry, poison ivy, honeysuckle, sumac, winged elm, and flowering dogwood.

This map unit has moderate to severe limitations for the management of timber. The main limitations are the hazard of erosion, the equipment limitation, the seedling mortality rate, and plant competition. Exposing the surface by removing ground cover increases the hazard of erosion, and exposed soil surfaces are subject to rill and gully erosion. Roads, landings, and skid trails can be protected against erosion by constructing diversions, mulching, and seeding. Using standard wheeled and tracked equipment when the soils are wet results in rutting and compaction and increases the hazard of erosion. Harvesting activities should be planned for drier periods. The high seedling mortality rate is caused by droughtiness. It can be compensated for by increasing the number of trees planted. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation. The competing vegetation can be controlled by mechanical methods, herbicides, or prescribed fire.

This map unit is poorly suited to most urban uses. It has severe limitations for building sites, local roads and streets, and for most kinds of sanitary facilities. The main limitations are the depth to bedrock, the very slow permeability, and the high shrink-swell potential of the Watsonia soil.

This map unit has poor potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

The Demopolis and Watsonia soils are in capability subclass VIe. The woodland ordination symbol is 3D for the Demopolis soil and 7D for the Watsonia soil.

EuA—Eunola sandy loam, 0 to 2 percent slopes, rarely flooded

This very deep, moderately well drained soil is on low terraces that are parallel to rivers and large streams throughout the county. Flooding is rare, but it can occur under unusual weather conditions. Slopes are generally long and smooth. Individual areas are generally oblong in shape. They range from 5 to about 100 acres in size.

Typically, the surface layer is brown sandy loam about 8 inches thick. The subsoil, to a depth of 54 inches, is yellowish brown sandy clay loam in the upper part, yellowish brown sandy clay loam that has light brownish gray and yellowish red mottles in the next part, and yellowish brown sandy loam that has grayish and reddish mottles in the lower part. The substratum, to a depth of 62 inches, is yellowish brown sand that has brownish and grayish mottles.

Important properties of the Eunola soil—

Permeability: Moderate in the subsoil; rapid in the substratum
Available water capacity: Moderate
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Apparent, at a depth of 1.5 to 2.5 feet from December through March
Shrink-swell potential: Low
Flooding: Rare

Included in mapping are a few small areas of Bethera, Bonneau, Cahaba, Lynchburg, and Rains soils. The poorly drained Bethera and Rains soils and the somewhat poorly drained Lynchburg soils are in lower, less convex landscape positions than the Eunola soil. Bonneau and Cahaba soils are in slightly higher, more convex landscape positions. Bonneau soils have thick sandy surface and subsurface layers. Cahaba soils have a reddish subsoil. Also included are small areas of Eunola soils that are not subject to flooding. Included soils make up about 10 percent of the map unit, but individual areas generally are less than 5 acres in size.

Most areas of this map unit are used for woodland. A few areas are used for cultivated crops, pasture, and hay.

This soil is well suited to cultivated crops. The main limitations are the wetness and the low fertility. This soil is friable and easy to keep in good tilth. It can be worked over a wide range of moisture content. Shallow ditches help to remove excess surface water. Using minimum tillage and returning all crop residue to the soil or regularly adding other organic matter improve fertility and help to maintain tilth and the content of organic matter. Most crops respond well to applications of lime and fertilizer.

This map unit is well suited to pasture and hay. Wetness is a moderate limitation. Grasses such as bermudagrass and bahiagrass are well suited. Excessive surface water can be removed by shallow ditches. Deferred or restricted grazing during very wet periods helps to keep the pasture in good condition. Applications of lime and fertilizer improve soil fertility and promote the good growth of forage plants.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, yellow poplar, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of greenbrier, blackberry, panicums, longleaf uniola, poison ivy, sweetgum, and water oak.

This soil has moderate limitations for the management of timber. The main limitations are the restricted use of equipment and plant competition. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Using low-pressure ground equipment reduces damage to the soil and helps to maintain productivity. Harvesting activities should be planned during seasons of the year when the soil is dry. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation. The competing vegetation can be controlled by site preparation or controlled burning.

This map unit is poorly suited to most urban uses. The main limitations are flooding and wetness. Although it is generally not feasible to control flooding, buildings can be placed on pilings or mounds to elevate them above the expected flood level.

This map unit has good potential as habitat for openland and woodland wildlife and poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants. Prescribed burning every three years, rotated among several tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Eunola soil is in capability subclass IIw. The woodland ordination symbol is 9W.

GrB—Greenville sandy loam, 1 to 3 percent slopes

This very deep, well drained soil is on broad ridgetops of the uplands. Slopes are long and smooth. They range from 75 to 200 feet in length. Individual areas are generally broad. They range from 10 to 350 acres in size.

Typically, the surface layer is dark reddish brown sandy loam about 8 inches thick. The subsoil, to a depth of 72 inches, is dark red clay.

Important properties of the Greenville soil—

Permeability: Moderate
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Figure 3.—An area of Greenville sandy loam, 1 to 3 percent slopes. This soil is well suited to cultivated crops such as corn.

Included in mapping are a few small areas of Lucedale, Orangeburg, and Rains soils. Lucedale and Orangeburg soils are in slightly higher landscape positions than the Greenville soil. They have a loamy subsoil. The poorly drained Rains soils are in slightly lower, more concave landscape positions than the Greenville soil. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for cultivated crops, pasture, or hay. A few areas are used as sites for homes, and a few areas are wooded.

This soil is well suited to cultivated crops (fig. 3). It has few limitations for this use, although the low fertility and the hazard of erosion are management concerns. The surface layer of this soil is friable, but it is difficult to keep in good tilth in areas where cultivation has mixed some of clayey subsoil into the plow layer. Using conservation practices, such as cover crops, contour farming, minimum tillage, and returning all crop residue to the soil or regularly adding other organic matter, improve fertility and help to maintain tilth and the content of organic matter. Most crops respond well to systematic applications of lime and fertilizer.

This soil is well suited to pasture and hay. It has no significant limitations for these uses, although low fertility is a management concern. Coastal bermudagrass and bahiagrass are the commonly grown grasses. Proper stocking rates, pasture rotation, and restricting grazing during wet periods help to keep the pasture in good condition. Applications of lime and fertilizer improve the fertility and increase the production of forage.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.1 cords per acre per year. The understory vegetation consists mainly of little bluestem, yellow jessamine, longleaf uniola, huckleberry, flowering dogwood, and greenbrier.

This soil has few limitations affecting the production of timber, although plant competition is a minor management concern. Using proper site preparation practices and spraying, cutting, or girdling can eliminate unwanted weeds, brush, and trees.

This soil is well suited to most urban uses. It has slight to moderate limitations for most uses. The main limitation is the moderate permeability. Septic tank absorption fields may not function properly because of the moderate permeability. Enlarging the size of the absorption field can help to overcome this limitation.

This soil has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat for woodland wildlife can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Greenville soil is in capability subclass IIe. The woodland ordination symbol is 8A.

GsC2—Greenville sandy clay loam, 3 to 8 percent slopes, eroded

This very deep, well drained soil is on narrow ridgetops and on side slopes in the uplands. In most areas, the surface layer of this soil is a mixture of the original surface layer and material from the subsoil. In some places, all of the original surface layer has been removed. Some areas have a few rills and gullies. Slopes are generally long and smooth, but some are short and complex. Individual areas are irregular in shape. They range from 10 to 250 acres in size.

Typically, the surface layer is dark reddish brown sandy clay loam about 5 inches thick. The subsoil, to a depth of 80 inches, is dark red clay.

Important properties of the Greenville soil—

Permeability: Moderate
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Luverne and Smithdale soils. They are in landscape positions similar to those of the Greenville soil. Luverne soils do not have a dark red argillic horizon and have a thinner solum than the Greenville soil. Smithdale soils are loamy throughout the profile. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for cultivated crops, pasture, or hay. A few areas are wooded.

This soil is poorly suited to cultivated crops. The slope, the low fertility, and the severe hazard of erosion are the main limitations. Sheet and rill erosion is evident in most areas, and shallow gullies are common. The surface layer of these soils is friable, but it is difficult to keep in good tilth in areas where cultivation has mixed some of the clayey subsoil into the plow layer. Conservation tillage, terraces, contour farming, and cover crops reduce the runoff rate and help to control erosion. Drop-inlet structures, installed in grassed waterways, help to prevent gullying. Returning all crop residue to the soil helps to maintain tilth, reduces crusting, and increases the water-holding capacity. Most crops respond well to systematic applications of fertilizer and lime.

This soil is suited to pasture and hay. Bahiagrass and coastal bermudagrass are the commonly grown grasses. The main management concerns are the low fertility and the severe hazard of erosion. The seedbed should be prepared on the contour or across the slope if practical. Applications of lime and fertilizer improve fertility and increase the production of forage. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, shortleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.1 cords per acre per year. The understory vegetation consists mainly of little bluestem, greenbrier, panicums, huckleberry, sumac, muscadine grape, and flowering dogwood.

This soil has few limitations affecting woodland management; however, competition from understory plants is a minor management concern. Carefully managed reforestation helps to control competition from undesirable understory plants. Proper site preparation practices, such as chopping, burning, and applying herbicide, help to control the initial plant competition and facilitate mechanical planting. Management activities should include conservation practices to control soil erosion. Roads and landings can be protected from erosion by constructing diversions and by seeding cuts and fills.

This soil is suited to most urban uses. It has slight limitations for building sites and local roads and streets and moderate limitations for most kinds of sanitary facilities. The main limitations are the moderate permeability and the slope. Septic tank absorption fields may not function properly because of the moderate permeability. Increasing the size of the absorption area or using an alternate system of waste disposal helps to overcome this limitation. Absorption lines should be installed on the contour.

This soil has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat for deer, turkey, and squirrel can be improved by planting or encouraging the growth of existing oak trees and suitable understory plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey. Habitat for openland wildlife can be improved by leaving undisturbed areas of vegetation around cropland and pasture to provide food and resting areas for red fox, rabbits, quail, and songbirds.

This Greenville soil is in capability subclass IVe. The woodland ordination symbol is 8A.

GtD3—Greenville clay loam, 8 to 15 percent slopes, severely eroded

This very deep, well drained soil is on narrow ridges and side slopes of the uplands. In most areas, the surface layer of this soil is a mixture of the original surface layer and material from the subsoil. In some places, all of the original surface layer has been removed. Most areas have common or many rills and gullies. Slopes are generally short and complex. Individual areas are irregular in shape and range from 25 to more than 200 acres in size.

Typically, the surface layer is reddish brown clay loam about 3 inches thick. The subsoil, to a depth of 72 inches, is dark red sandy clay. In places, the surface layer has from 15 to 25 percent fragments of ironstone.

Important properties of the Greenville soil—

Permeability: Moderate
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Bibb, Luverne, and Smithdale soils. The poorly drained Bibb soils are on narrow flood plains. The Luverne and Smithdale soils are in landscape positions similar to those of the Greenville soil. Luverne soils do not have a dark red subsoil, and they have a thinner solum than the Greenville soil. Smithdale soils are loamy throughout the profile. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used as woodland and pasture. A few areas are used for hay.

This map unit is poorly suited to most cultivated crops. The complex topography and the moderately sloping to moderately steep slopes are severe limitations for the use of equipment. Erosion is a severe hazard. Gullies form readily in areas that have a concentrated flow of water on the surface. If the soils are cultivated, all tillage should be on the contour or across the slope.

This soil is poorly suited to pasture and hay. The complex slope and the severe hazard of erosion are the main limitations. The use of equipment is limited by the sloping, complex topography and the deep gullies. Tillage should be on the contour or across the slope if practical. Proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture in good condition. Applications of lime and fertilizer improve soil fertility and promote the good growth of forage plants.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, shortleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.1 cords per acre per year. The understory vegetation consists mainly of little bluestem, panicums, greenbrier, poison ivy, huckleberry, muscadine grape, waxmyrtle, and flowering dogwood.

This map unit has moderate limitations for the management of timber. The main limitations are the hazard of erosion, the equipment limitation, and plant competition. Exposing the surface by removing ground cover increases the hazard of erosion. Exposed soil surfaces are subject to rill and gully erosion. Roads, landings, and skid trails can be protected against erosion by constructing diversions, mulching, and seeding. The slope and deep gullies restrict the use of equipment. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Management activities should be conducted during seasons of the year when the soil is dry. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation. The competing vegetation can be controlled by mechanical methods, herbicides, or prescribed fire.

This soil is poorly suited to most urban uses. It has moderate limitations for building sites, local roads and streets, and for most kinds of sanitary facilities. The main limitations are the slope and the moderate permeability. Erosion is a hazard in the steeper areas. Only the part of the site that is used for construction should be disturbed. Access roads can be designed so that surface runoff is controlled and cut slopes are stabilized. Septic tank absorption fields may not function properly because of the slope and the moderate permeability. Effluent from absorption fields may surface in downslope areas and create a hazard to health. Alternative methods of sewage disposal should be used to properly dispose of waste.

This map unit has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers

This Greenville soil is in capability subclass VIe. The woodland ordination symbol is 8A.

HaB—Halso silt loam, 1 to 3 percent slopes

This deep, moderately well drained soil is on broad ridgetops in the uplands. Slopes are generally long and smooth. They range from 100 to 300 feet in length. Individual areas are generally oblong in shape. They range from 10 to 400 acres in size.

Typically, the surface layer is brown silt loam about 3 inches thick. The subsoil, to a depth of 48 inches, is dark reddish brown clay in the upper part and red clay that has grayish and brownish mottles in the lower part. The substratum, to a depth of 60 inches, is light brownish gray clayey shale and light yellowish brown clay loam in the upper part and light brownish gray clayey shale in the lower part.

Important properties of the Halso soil—

Permeability: Very slow
Available water capacity: Moderate
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: 40 to 60 inches
Root zone: 40 to 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: High
Flooding: None

Included in mapping are a few small areas of Arundel, Luverne, and Orangeburg soils. Arundel soils are in slightly lower landscape positions than the Halso soil. They have claystone bedrock within a depth of 20 to 40 inches. Luverne and Orangeburg soils are in slightly higher landscape positions than the Halso soil. Luverne soils do not have bedrock within a depth of 80 inches. Orangeburg soils are loamy throughout the profile. Included soils make up about 15 percent of mapped areas, but individual areas are generally less than 5 acres in size.

Most areas of this map unit are used as woodland. A few areas are used for pasture and hay.

This soil is suited to cultivated crops. The main management concerns are the low fertility, poor tilth, and the moderate hazard of erosion. Measures that control erosion include early-fall seeding, minimum tillage, terraces, diversions, grassed waterways, and cover crops. Tillage should be on the contour or across the slope. Maintaining crop residue on or near the surface helps to control runoff and maintains tilth and the content of organic matter. Most crops respond well to systematic applications of fertilizer and lime.

This soil is well suited to pasture and hay. Bahiagrass and coastal bermudagrass are the main grasses grown. The main management concerns are the low fertility and the hazard of erosion. The seedbed should be prepared on the contour or across the slope if practical. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This soil is well suited to loblolly pine and slash pine. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.1 cords per acre per year. The understory is mainly greenbrier, flowering dogwood, poison ivy, yellow jessamine, little bluestem, longleaf uniola, huckleberry, sweetgum, water oak, muscadine grape, and panicums.

This soil generally has moderate or severe limitations for the management of timber. The main limitations are the restricted use of equipment and the plant competition. The low strength restricts the use of equipment to periods when the soil is dry. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Using low-pressure ground equipment reduces damage to the soil and helps to maintain productivity. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial plant competition, and herbicides can be used to control the subsequent growth.

This soil is poorly suited to most urban uses. It has severe limitations for building sites, local roads and streets, and most kinds of sanitary facilities. The main limitations are the very slow permeability, the high shrink-swell potential, and low strength on sites for roads and streets. If excavations are made, the cutbanks cave easily. Properly designing foundations and footings and diverting runoff away from the buildings help to prevent the structural damage that results from shrinking and swelling. Septic tank absorption fields will not function properly during rainy periods because of the very slow permeability. An alternative method of sewage disposal is needed to dispose of sewage properly.

This soil has good potential as habitat for openland and woodland wildlife and poor potential as habitat for wetland wildlife. Habitat for deer, turkey, and squirrel can be improved by planting or encouraging the growth of existing oak trees and suitable understory plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Halso soil is in capability subclass IIIe. The woodland ordination symbol is 9C.

HbC—Halso fine sandy loam, 3 to 8 percent slopes

This deep, moderately well drained soil is on ridgetops and side slopes in the uplands. Slopes are generally long and smooth, but some are short and complex. They range from 50 to 200 feet in length. Individual areas are irregular in shape. They range from 10 to 200 acres in size.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsoil, to a depth of 44 inches, is dark red clay in the upper part, red clay with grayish mottles in the next part, and mottled in shades of gray, red, yellowish red, and strong brown clay in the lower part. The substratum, to a depth of 60 inches, is light brownish gray clayey shale.

Important properties of the Halso soil—

Permeability: Very slow
Available water capacity: Moderate
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: 40 to 60 inches
Root zone: 40 to 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: High
Flooding: None

Included in mapping are a few small areas of Arundel, Bibb, Luverne, and Orangeburg soils. Arundel soils are on the lower parts of slopes. They have soft bedrock within a depth of 20 to 40 inches. The poorly drained Bibb soils are on narrow flood plains. Luverne and Orangeburg soils are on slightly higher knolls or ridges. Luverne soils have mixed mineralogy and do not have bedrock within a depth of 80 inches. Orangeburg soils are loamy throughout the profile. Included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used as woodland. A few areas are used for pasture or hay.

This soil is poorly suited to most cultivated crops. The main management concerns are the low fertility and the severe hazard of erosion. Measures that control erosion include early-fall seeding, minimum tillage, terraces, diversions, and grassed waterways. Tillage should be on the contour or across the slope. Maintaining crop residue on or near the surface helps to control runoff and maintain tilth and the content of organic matter. Most crops respond well to systematic applications of fertilizer and lime.

This soil is well suited to pasture and hay. Bahiagrass and coastal bermudagrass are the main grasses grown. The main management concerns are the low fertility and the hazard of erosion. The seedbed should be prepared on the contour or across the slope if practical. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Applications of lime and fertilizer improve soil fertility and increase the production of forage.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include shortleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.1 cords per acre per year. The understory vegetation consists mainly of muscadine grape, poison ivy, yellow jessamine, flowering dogwood, longleaf uniola, and panicums.

This soil generally has slight limitations for the management of timber. The plant competition, however, is a severe limitation. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial growth of undesirable vegetation, and herbicides can be used to maintain control. Exposing the surface by removing ground cover increases the hazard of erosion, and exposed soil surfaces are subject to rill and gully erosion. Roads, landings, and skid trails can be protected against erosion by constructing diversions, mulching, and seeding.

This soil is poorly suited to most urban uses. It has moderate to severe limitations for building sites, local roads and streets, and most kinds of sanitary facilities. The main limitations are the high shrink-swell potential, the very slow permeability, and low strength on sites for roads and streets. If excavations are made, the cutbanks cave easily. Properly designing foundations and footings and diverting runoff away from the buildings help to prevent the structural damage that results from shrinking and swelling. Roads and streets can be built if they are designed to compensate for the low strength and instability of the subsoil. Septic tank absorption fields will not function properly because of the very slow permeability. An alternate method of sewage disposal is needed to dispose of sewage properly.

This soil has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat for white-tailed deer, turkey, and squirrel can be improved by planting or encouraging the growth of existing oak trees and suitable understory plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

This Halso soil is in capability subclass IVe. The woodland ordination symbol is 9C.

LeA—Leeper clay loam, 0 to 1 percent slopes, frequently flooded

This very deep, somewhat poorly drained soil is on the flood plains of streams in the northwest corner of the county. It is subject to flooding for brief periods several times each year. Individual areas are generally long and narrow. They range from 10 to 200 acres in size.

Typically, the surface layer is brown clay loam about 3 inches thick. The subsoil, to a depth of 36 inches, is dark grayish brown silty clay in the upper part and dark gray clay in the lower part. The substratum, to a depth of 60 inches, is gray silty clay that has brownish mottles.

Important properties of the Leeper soil—

Permeability: Very slow
Available water capacity: High
Organic matter content: Medium
Natural fertility: Medium
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Perched, at a depth of 1.0 to 2.0 feet from December through April
Shrink-swell potential: High
Flooding: Frequent

Included in mapping are a few small areas of Congaree soils. Also included are small areas of poorly drained soils in depressions. The moderately well drained Congaree soils are on high parts of natural levees, adjacent to the stream channel. They are loamy throughout the profile. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used as pasture and woodland. A few small areas are used for hay or cultivated crops.

This soil is poorly suited to cultivated crops. The flooding and wetness are the major management concerns. Tillage and planting may be delayed in spring, and crops may be damaged by flooding in late spring and early summer. Although flooding can be controlled by a system of levees and pumps, the system is often impractical to install. Shallow ditches help to remove water from the surface.

This soil is poorly suited to pasture and hay because of the frequent flooding and the wetness. Grasses that are tolerant of wetness and flooding are recommended. Common bermudagrass is a suitable grass. Deferred grazing during wet periods helps to keep the soil and sod in good condition. A drainage system helps to remove excess water from the surface.

This soil is well suited to water oak and other hardwoods. It is generally not suited to pine trees because it is alkaline within 20 inches of the surface. Other species that commonly grow in areas of this soil include green ash, sweetgum, American sycamore, cherrybark oak, and yellow poplar. On the basis of a 50-year site curve, the site index for water oak is 95. The average annual growth of well stocked, even-aged, unmanaged stands of water oak at 30 years of age is 1.1 cords per acre per year. The understory vegetation consists mainly of switchcane, honeylocust, poison ivy, winged elm, hackberry, blackberry, Osage-orange, and panicums.

This soil has moderate or severe limitations for the management of timber. The main limitations are the restricted use of equipment, the seedling mortality rate, and plant competition. The seasonal high water table, the flooding, and the low strength of the subsoil restrict the use of equipment to periods when the soil is dry. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Using low-pressure ground equipment reduces damage to the soil and helps to maintain productivity. The high seedling mortality rate is caused by excessive wetness and the clayey texture of the surface layer. It can be reduced by planting on beds or increasing the tree planting rate. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial plant competition, and herbicides can be used to control the subsequent growth.

This soil is poorly suited to most urban uses. The flooding, the wetness, the very slow permeability, the high shrink-swell potential, and low strength if used for local roads and streets are severe limitations. If buildings are constructed in areas of this soil, they should be placed on pilings or on well-compacted fill material to elevate them above the expected flood level.

This soil has good potential as habitat for woodland wildlife and fair potential as habitat for openland and wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

This Leeper soil is in capability subclass IVw. The woodland ordination symbol is 7W.

LfB—Lucedale sandy loam, 1 to 3 percent slopes

This very deep, well drained soil is on broad ridgetops in the uplands. Slopes are long and smooth. They range in length from 75 to 250 feet. Individual areas are broad. They range from 10 to 450 acres in size.

Typically, the surface layer is dark reddish brown sandy loam about 8 inches thick. The subsoil, to a depth of 72 inches, is dark red loam in the upper part and dark red sandy clay loam in the lower part.

Important properties of the Lucedale soil—

Permeability: Moderate
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Greenville, Orangeburg, and Rains soils. Greenville soils are in slightly lower landscape positions and have a clayey subsoil. Orangeburg soils are in slightly higher landscape positions than the Lucedale soils. They do not have dark red colors throughout the subsoil. The poorly drained Rains soils are in small depressions. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for cultivated crops, pasture, or hay. A few small areas are wooded, and a few areas are used as sites for homes.

This soil is well suited to cultivated crops (fig. 4). There are few limitations for this use; however, the low fertility and the moderate hazard of erosion are management concerns. The soil is friable and can be easily kept in good tilth. It can be worked throughout a wide range in moisture content. Conservation tillage, terraces, contour farming, and cover crops reduce the runoff rate and help to control erosion. Using minimum tillage and returning all crop residue to the soil or regularly adding other organic matter improve fertility and help to maintain tilth and the content of organic matter. Crops respond well to systematic applications of fertilizer and lime.

This soil is well suited to pasture and hay. There are few limitations for this use; however, the low fertility and the moderate hazard of erosion are management concerns. Coastal bermudagrass and bahiagrass are well suited. Tillage should be on the contour or across the slope. Proper stocking rates, pasture rotation, and restricted grazing during prolonged wet or dry periods help to keep the pasture in good condition. Applications of lime and fertilizer improve the soil fertility and promote the good growth of forage plants.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, water oak, and sweetgum. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of little bluestem, panicums, huckleberry, flowering dogwood, honeysuckle, blackberry, sweetgum, greenbrier, poison ivy, and muscadine grape.

This soil has few limitations affecting woodland management; however, competition from understory plants is a minor management concern. Carefully managed reforestation helps to control competition from undesirable understory plants. Site preparation practices, such as chopping, burning, and applying herbicide, help to control initial plant competition and facilitate mechanical planting.

This soil is well suited to most urban uses, and it has no significant limitations for these uses.

This map unit has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Lucedale soil is in capability subclass IIe. The woodland ordination symbol is 9A.

LgB—Lucy loamy sand, 0 to 5 percent slopes

This very deep, well drained soil is on narrow to broad ridgetops of the uplands. Slopes are generally long and

Figure 4.—High yields of soybeans can be expected in this area of Lucedale sandy loam, 1 to 3 percent slopes.

smooth, but they may be short and complex. They range in length from 75 to 450 feet. Individual areas are irregular in shape. They range from 10 to 100 acres in size.

Typically, the surface layer is brown loamy sand about 8 inches thick. The subsurface layer, to a depth of 33 inches, is brown loamy sand. The subsoil, to a depth of 60 inches, is yellowish red sandy loam in the upper part and yellowish red sandy clay loam in the lower part.

Important properties of the Lucy soil—

Permeability: Rapid in the surface layer and subsurface layer; moderate in the subsoil
Available water capacity: Low
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Orangeburg, Smithdale, and Troup soils. Orangeburg soils are in slightly higher landscape positions than the Lucy soil. They do not have thick sandy surface and subsurface layers. Smithdale soils are commonly in slightly lower landscape positions than the Lucy soil. They do not have thick sandy surface and subsurface layers. Troup soils are in landscape positions similar to those of the Lucy soil. They have sandy surface and subsurface layers more than 40 inches thick. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used as woodland, pasture, or hay. Some areas are used for cultivated crops or as sites for homes.

This soil is suited to cultivated crops. The moderate hazard of erosion, the low fertility, and the low available water capacity are the main limitations. Contour farming, minimum tillage, and cover crops reduce the runoff rate and help to control erosion. Returning crop residue to the soil helps to maintain tilth and increases the water-holding capacity. Irrigation can prevent crop damage and increase productivity in most years. Most crops respond well to applications of lime and frequent, light applications of fertilizer.

This soil is well suited to pasture and hay. Coastal bermudagrass and bahiagrass are well suited to this soil. The main limitations are the low fertility and the low available water capacity. The leaching of plant nutrients is a management concern. Frequent, light applications of nitrogen are necessary to maintain the productivity of grasses. Proper stocking rates, pasture rotation, and restricted grazing during prolonged dry periods help to keep the pasture in good condition.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.1 cords per acre per year. The understory vegetation consists mainly of little bluestem, panicums, greenbrier, prickly pear cactus, bracken fern, common persimmon, flowering dogwood, and blackjack oak.

This soil has moderate limitations for the management of timber. The main limitations are the restricted use of equipment, the seedling mortality rate, and plant competition. The sandy texture of the surface layer restricts the use of wheeled equipment, especially when the soil is very dry. Harvesting activities should be planned during seasons of the year when the soil is moist. The moderate seedling mortality rate is caused by droughtiness. It can be compensated for by increasing the number of trees planted. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation. The competing vegetation can be controlled by mechanical methods, herbicides, or prescribed fire.

This soil is well suited to most urban uses. The thick sandy surface layer, the low fertility, and the low available water capacity are the main management concerns. Applying lime and fertilizer, mulching, and irrigating help to establish lawns and landscape plants.

This soil has fair potential as habitat for openland wildlife, good potential as habitat for woodland wildlife, and very poor potential as habitat for wetland wildlife. The low available water capacity and the low natural fertility are limitations for improving the potential as habitat for wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Lucy soil is in capability subclass IIs. The woodland ordination symbol is 8S.

LuB—Luverne sandy loam, 1 to 5 percent slopes

This very deep, well drained soil is on narrow to broad ridgetops of the uplands. Slopes are long and smooth. They range in length from 75 to 350 feet. Individual areas are irregular in shape. They range from 10 to 300 acres in size.

Typically, the surface layer is brown sandy loam about 8 inches thick. The subsoil, to a depth of 42 inches, is yellowish red clay. The substratum, to a depth of 60 inches, is stratified clay, clay loam, sandy loam, and loam. Individual strata are light grayish brown, brownish yellow, and yellowish brown.

Important properties of the Luverne soil—

Permeability: Moderately slow
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Moderate
Flooding: None

Included in mapping are a few small areas of Halso and Orangeburg soils. Halso soils are in slightly lower landscape positions than the Luverne soil. They have shale bedrock within a depth of 40 to 60 inches. Orangeburg soils are in slightly higher landscape positions than the Luverne soil. They are loamy throughout the profile. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for woodland, pasture, or hay. A few areas are used for cultivated crops or as sites for homes.

This soil is suited to cultivated crops. The main management concerns are the low fertility and the severe hazard of erosion. Terraces, contour farming, minimum tillage, and cover crops reduce the runoff rate and help to control erosion. Using a sod-based rotation system and incorporating crop residue into the soil increase the content of organic matter and improve tilth. Crops respond well to systematic applications of lime and fertilizer.

This soil is well suited to pasture and hay, and it has few limitations for these uses. Erosion is a hazard when the soil surface is bare during the establishment of pasture. Tillage should be on the contour or across the slope to reduce soil losses. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture and soil in good condition. Applications of lime and fertilizer improve fertility and increase the production of forage.

This soil is well suited to loblolly pine and slash pine (fig. 5). Other species that commonly grow in areas of this soil include shortleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of greenbrier, poison ivy, flowering dogwood, waxmyrtle, little bluestem, huckleberry, American beautyberry, muscadine grape, common persimmon, and panicums.

This soil has moderate limitations affecting the management of timber. The main limitations are the restricted use of equipment and plant competition. The low strength of the clayey subsoil restricts the use of equipment when the soil is wet. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Using low-pressure ground equipment reduces damage to the soil and helps to maintain productivity. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial plant competition, and herbicides can be used to control the subsequent growth.

This soil is suited to most urban uses. It has moderate limitations for building sites and severe limitations for local roads and streets and most kinds of sanitary facilities. The main limitations are the moderately slow permeability, the moderate shrink-swell potential, and low strength if used as a site for local roads and streets. Properly designing foundations and footings and diverting runoff away from the buildings help to prevent the structural damage that results from shrinking and swelling. Septic tank absorption fields will not function properly during rainy periods because of the moderately slow permeability. An alternative method of sewage disposal is needed to dispose of sewage properly.

This soil has good potential as habitat for openland and woodland wildlife and poor potential as habitat for wetland wildlife. Habitat for deer, turkey, and squirrel can be improved by planting or encouraging the growth of existing oak trees and suitable understory plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Luverne soil is in capability subclass IIIe. The woodland ordination symbol is 9C.

LuC—Luverne sandy loam, 5 to 8 percent slopes

This very deep, well drained soil is on side slopes and narrow ridgetops in the uplands. Slopes are generally short and complex. They range in length from 50 to 200 feet. Most areas are irregular in shape. They range from 10 to 300 acres in size.

Typically, the surface layer is brown sandy loam about 4 inches thick. The subsurface layer, to a depth of 11 inches, is light yellowish brown sandy loam. The subsoil, to a depth of 40 inches, is yellowish red clay and sandy clay in the upper part and yellowish red clay loam in the lower part. The substratum, to a depth of 60 inches, is thinly stratified, yellowish red sandy loam, light gray clay, and strong brown sandy clay loam.

Important properties of the Luverne soil—

Permeability: Moderately slow
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Moderate
Flooding: None

Included in mapping are a few small areas of Arundel, Bibb, Halso, and Smithdale soils. Also included are small areas of severely eroded soils. Arundel and Halso soils are on slightly lower parts of side slopes. Arundel soils have bedrock within a depth of 20 to 40 inches. Halso soils have bedrock within a depth of 40 to 60 inches. The poorly drained Bibb soils are on narrow flood plains. Smithdale soils are in landscape positions similar to those of the Luverne soil. They are loamy throughout the profile. The included soils make up about 15 percent of the map unit, but individual areas generally are less than 5 acres in size.

Most areas of this soil are used as woodland or pasture. A few areas are used for cultivated crops or hay.

This soil is poorly suited to cultivated crops. The main management concerns are the low fertility, the poor tilth, and the severe hazard of erosion. Terraces, contour farming, minimum tillage, and cover crops reduce the runoff rate and help to control erosion. Drop-inlet structures, installed in grassed waterways, help to prevent gullying. Using a sod-based rotation system and incorporating crop residue into the soil increase the content of organic matter and improve tilth. Most crops respond well to systematic applications of lime and fertilizer.

This soil is well suited to pasture and hay. Erosion is a hazard when the soil surface is bare during the establishment of pasture. Tillage should be on the contour

Figure 5.—This area of Luverne sandy loam, 1 to 5 percent slopes, has been converted from pasture to woodland. This soil is well suited to loblolly pine.

or across the slope to reduce soil losses. Proper stocking rates, pasture rotation, and restricted grazing during prolonged wet or dry periods helps to keep the pasture and soil in good condition. Applications of lime and fertilizer improve fertility and increase the production of forage.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, shortleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of little bluestem, panicums, greenbrier, poison ivy, huckleberry, muscadine grape, waxmyrtle, and flowering dogwood.

This map unit has moderate limitations for the management of timber. The main limitations are the restricted use of equipment and plant competition. The low strength of the clayey subsoil restricts the use of equipment, especially when the soil is wet. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Using low-pressure ground equipment reduces damage to the soil and helps to maintain productivity. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial plant competition, and herbicides can be used to control the subsequent growth.

This soil is suited to most urban uses. It has moderate limitations for building sites and has severe limitations for local roads and streets and most kinds of sanitary facilities. The main limitations are the moderate shrink-swell potential, the moderately slow permeability, and the low strength when used as sites for roads or streets. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has low shrink-swell potential. Roads and streets should be designed to offset the limited ability of this soil to support a load. Septic tank absorption fields may not function properly because of the moderately slow permeability. Enlarging the size of the absorption field or using an alternative method of waste disposal helps to overcome this limitation.

This soil has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat for deer, turkey, and squirrel can be improved by planting or encouraging the growth of existing oak trees and suitable understory plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

This Luverne soil is in capability subclass IVe. The woodland ordination symbol is 9C.

LuE—Luverne sandy loam, 8 to 25 percent slopes

This very deep, well drained soil is on narrow ridges and side slopes of the uplands. Most areas are dissected by deeply incised, intermittent drainageways. Slopes are generally short and complex. They range in length from 25 to 150 feet. Individual areas are irregular in shape and range from 10 to 300 acres in size.

Typically, the surface layer is dark brown sandy loam about 4 inches thick. The subsurface layer, to a depth of 13 inches, is brown sandy loam. The subsoil, to a depth of 40 inches, is yellowish red sandy clay in the upper part and yellowish red clay in the lower part. The substratum, to a depth of 60 inches, is stratified clay, clay loam, sandy loam, and loam. Individual strata are light grayish brown, brownish yellow, and yellowish brown.

Important properties of the Luverne soil—

Permeability: Moderately slow
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Moderate
Flooding: None

Included in mapping are a few small areas of Arundel, Bibb, Halso, Smithdale, and Troup soils. The Arundel and Halso soils are on slightly lower parts of side slopes. Arundel soils have bedrock within a depth of 20 to 40 inches. Halso soils have bedrock within a depth of 40 to 60 inches. The poorly drained Bibb soils are on narrow flood plains. Smithdale soils are in landscape positions similar to those of the Luverne soil. They are loamy throughout the profile. Troup soils are on narrow ridgetops, and they have thick sandy surface and subsurface layers. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used as woodland. A few areas are used for pasture and hay.

This map unit is unsuited to most cultivated crops. The complex topography and the moderately sloping to moderately steep slopes are severe limitations for the use of equipment. Erosion is a severe hazard. Gullies form readily in areas that have a concentrated flow of water on the surface. If the soil is cultivated, all tillage should be on the contour or across the slope.

This soil is poorly suited to pasture and hay. The complex slopes and the severe hazard of erosion are the main limitations. The use of equipment is limited by the sloping, complex topography. Tillage should be on the contour or across the slope if practical. Grasses requiring low maintenance are best suited to the more steeply sloping areas. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Applications of lime and fertilizer improve soil fertility and promote good growth of forage plants.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, shortleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year (fig. 6). The understory vegetation consists mainly of little bluestem, panicums, greenbrier, poison ivy, huckleberry, muscadine grape, waxmyrtle, and flowering dogwood.

This map unit has moderate limitations for the management of timber. The main limitations are the hazard of erosion, the equipment limitations, and plant competition. Exposing the surface by removing ground cover increases the hazard of erosion. Exposed soil surfaces are subject to rill and gully erosion. Roads, landings, and skid trails can be protected against erosion by constructing diversions, mulching, and seeding. The slope restricts the use of equipment. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Management activities should be conducted during seasons of the year when the soil is dry. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation. The competing vegetation can be controlled by mechanical methods, herbicides, or prescribed fire.

This soil is poorly suited to most urban uses. It has moderate to severe limitations for building sites, local roads and streets, and for most kinds of sanitary facilities. The main limitations are the slope, the moderate shrink-swell potential, the moderately slow permeability, and low strength if used for roads and streets. Erosion is a hazard in the steeper areas. Only the part of the site that is used

Figure 6.—A well managed stand of loblolly pine in an area of Luverne sandy loam, 8 to 25 percent slopes.

for construction should be disturbed. Access roads can be designed so that surface runoff is controlled and cut slopes are stabilized. Roads should also be designed to offset the limited ability of this soil to support a load. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. Septic tank absorption fields may not function properly because of the slope and the moderately slow permeability. Effluent from absorption fields may surface in downslope areas and create a hazard to health. Alternative methods of sewage disposal should be used to properly dispose of waste.

This map unit has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

This Luverne soil is in capability subclass VIIe. The woodland ordination symbol is 9R.

LvC—Luverne-Urban land complex, 2 to 8 percent slopes

This map unit consists of the very deep, well drained Luverne soil and areas of Urban land. The areas are so intricately intermingled that they could not be mapped separately at the scale selected for mapping. The Luverne soil makes up about 50 percent of the map unit, and the Urban land makes up about 40 percent. Individual areas are rectangular in shape. They range from 10 to 200 acres in size.

Typically, the surface layer of the Luverne soil is brown sandy loam about 4 inches thick. The subsurface layer, to a depth of 11 inches, is light yellowish brown sandy loam. The subsoil, to a depth of 40 inches, is yellowish red clay and sandy clay in the upper part and yellowish red clay loam in the lower part. The substratum, to a depth of 60 inches, is thinly stratified, yellowish red sandy loam, light gray clay, and strong brown sandy clay loam.

Important properties of the Luverne soil—

Permeability: Moderately slow
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Moderate
Flooding: None

Urban land consists of areas that are covered by sidewalks, patios, driveways, parking lots, streets, playgrounds, and buildings.

Included in mapping are a few small areas of Orangeburg and Smithdale soils. Also included are areas of soils that have been manipulated to such an extent that the soil series cannot be identified. Orangeburg soils are in slightly higher landscape positions than the Luverne soil. They are loamy throughout the profile. Smithdale soils are in slightly lower landscape positions. They have a loamy subsoil. Included soils make up about 10 percent of the map unit, but individual areas generally are less than 5 acres in size.

Areas of the Luverne soil cannot be easily managed for crops, pasture, or timber or as wildlife habitat because of the limited size of the areas, the intermittent areas of Urban land, and areas of highly disturbed soils.

Areas of Luverne soil are suited to most urban uses. This soil has moderate limitations for building sites and severe limitations for local roads and streets and for most kinds of sanitary facilities. The main limitations are the moderate shrink-swell potential, the moderately slow permeability, and the low strength when used as sites for roads or streets. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. Roads and streets should be designed to offset the limited ability of this soil to support a load. Septic tank absorption fields may not function properly because of the moderately slow permeability. Enlarging the size of the absorption field or using an alternative method of waste disposal helps to overcome this limitation.

This map unit is not assigned to a capability subclass or a woodland ordination symbol.

LyA—Lynchburg sandy loam, 0 to 2 percent slopes

This very deep, somewhat poorly drained soil is on low terraces, in low areas of broad interstream divides, and on toe slopes. Slopes are long and smooth. Individual areas are generally broad. They range from 10 to 200 acres in size.

Typically, the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsurface layer, to a depth of 11 inches, is brown fine sandy loam. The subsoil, to a depth of 65 inches, is yellowish brown sandy clay loam that has brownish and grayish mottles in the upper part; light brownish gray clay loam that has reddish and yellowish mottles in the next part; and gray sandy clay in the lower part.

Important properties of the Lynchburg soil—

Permeability: Moderate
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Apparent, at a depth of 0.5 to 1.5 feet from December through April
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Bethera, Eunola, and Rains soils. The poorly drained Bethera and Rains soils are in slight depressions. The moderately well drained Eunola soils are in slightly higher, more convex landscape positions than the Lynchburg soil. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for woodland, pasture, or hay.

This soil is suited to cultivated crops. The main limitations are the low fertility and wetness. Planting may be delayed in the spring because of wetness. Shallow ditches help to remove excess water from the soil surface. Using minimum tillage and returning all crop residue to the soil or regularly adding other organic matter improve fertility and help to maintain tilth and the content of organic matter.

This soil is suited to pasture and hay. Wetness is the main limitation. Grasses that are tolerant of wet conditions are recommended. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture and soil in good condition. Applications of fertilizer and lime are needed for the optimum production of forage.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include sweetgum, water oak, and yellow-poplar. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.1 cords per acre per year. The understory vegetation consists mainly of longleaf uniola, panicums, poison ivy, American holly, waxmyrtle, huckleberry, blackgum, and little bluestem.

This soil generally has moderate or severe limitations for the management of timber. The main limitations are the restricted use of equipment and plant competition. Harvesting operations should be planned during seasons of the year when the soil is dry. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Using low-pressure ground equipment reduces damage to the soil and helps to maintain productivity. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation. The competing vegetation can be controlled by site preparation, herbicides, or prescribed fire.

This soil is poorly suited to most urban uses. Wetness is a severe limitation for building sites, local roads and streets, and for most kinds of sanitary facilities. A seasonal high water table is present during winter and spring, and a drainage system should be provided if buildings are constructed. A deep drainage system helps to reduce the wetness. Septic tank absorption fields will not function properly during rainy periods because of the wetness. Increasing the size of the absorption field or constructing the absorption field on a raised bed helps to compensate for this limitation.

This soil has good potential as habitat for openland and woodland wildlife and fair potential as habitat for wetland wildlife. Habitat for deer, turkey, and squirrel can be improved by planting or encouraging the growth of existing oak trees and suitable understory plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

This Lynchburg soil is in capability subclass IIw. The woodland ordination symbol is 8W.

MaB—Macon fine sandy loam, 1 to 5 percent slopes

This very deep, well drained soil is on stream terraces and toe slopes in the northwest corner of the county. Slopes are generally long and smooth. They range in length from 100 to 250 feet. Individual areas are broad. They range from 10 to 100 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 6 inches thick. The subsurface layer, to a depth of 13 inches, is yellowish brown fine sandy loam. The subsoil, to a depth of 72 inches, is yellowish red and red clay loam in the upper part and strong brown clay loam that has reddish, brownish, and grayish mottles in the lower part.

Important properties of the Macon soil—

Permeability: Slow
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Moderate
Flooding: None

Included in mapping are a few small areas of Searcy soils. The moderately well drained Searcy soils are in slightly lower landscape positions than the Macon soil. They have a clayey subsoil. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for pasture and hay. A few areas are used for cultivated crops and woodland.

This soil is well suited to cultivated crops. The main management concerns are the low fertility and the moderate hazard of erosion. Conservation tillage, terraces, contour farming, and cover crops reduce the runoff rate and help to control erosion. Using minimum tillage and returning all crop residue to the soil or regularly adding other organic matter improve fertility and help to maintain tilth and the content of organic matter. Crops respond well to additions of lime and fertilizer.

This soil is well suited to pasture and hay. It has few limitations for these uses; however, the low fertility and the moderate hazard of erosion are management concerns. Coastal bermudagrass and bahiagrass are the commonly grown grasses (fig. 7). Tillage should be on the contour or across the slope. Proper stocking rates, pasture rotation, and restricted grazing during prolonged wet and dry periods help to keep the pasture in good condition. Applications of lime and fertilizer improve

Figure 7.—An area of Macon fine sandy loam, 1 to 5 percent slopes. This soil is well suited to pasture.

soil fertility and promote the good growth of forage plants.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil are longleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of little bluestem, panicums, common persimmon, longleaf uniola, redbud, greenbrier, and blackberry.

This soil has few limitations affecting woodland management; however, competition from understory plants is a minor management concern. Carefully managed reforestation helps to control competition from undesirable understory plants. Site preparation practices, such as chopping, burning, and applying herbicide, help to control the initial plant competition and facilitate mechanical planting.

This soil is well suited to most urban uses. It has moderate limitations for building sites and local roads and streets and severe limitations for most kinds of sanitary facilities. The main limitations are the slow permeability, the moderate shrink-swell potential, and low strength if used for local roads and streets. Properly designing foundations and footings and diverting runoff away from the buildings help to prevent the structural damage that results from shrinking and swelling. Septic tank absorption fields will not function properly during rainy periods because of the slow permeability. Enlarging the size of the absorption field will help to overcome this limitation.

This map unit has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Macon soil is in capability subclass IIe. The woodland ordination symbol is 9A.

MbB—Malbis fine sandy loam, 1 to 3 percent slopes

This very deep, well drained soil is on broad ridgetops in the uplands. Slopes are generally long and smooth. They range in length from 100 to 400 feet. Individual areas are generally broad. They range from 10 to 300 acres in size.

Typically, the surface layer is brown and yellowish brown fine sandy loam about 9 inches thick. The subsoil, to a depth of 72 inches, is yellowish brown sandy clay loam in the upper part; brownish yellow sandy clay loam that has reddish mottles and plinthite in the next part; and mottled yellowish brown, red, and light brownish gray sandy clay loam in the lower part.

Important properties of the Malbis soil—

Permeability: Moderately slow
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Perched, at a depth of 2.5 to 4.0 feet from December through March
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Benndale, Bonneau, and Orangeburg soils. Benndale soils are in landscape positions similar to those of the Malbis soil. They are less clayey and do not have significant accumulations of plinthite in the subsoil. Bonneau soils are in slightly lower positions than the Malbis soil. They have thick sandy surface and subsurface layers. Orangeburg soils are on slightly higher, more convex knolls. They have reddish subsoil colors and do not have significant accumulations of plinthite in the subsoil. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for cultivated crops, pasture, or hay. A few areas are used as woodland and as sites for homes.

This soil is well suited to cultivated crops. The main management concerns are the low fertility and the moderate hazard of erosion. Conservation tillage, terraces, contour farming, and cover crops reduce the runoff rate and control erosion. Using minimum tillage and returning all crop residue to the soil or regularly adding other organic matter help improve and maintain tilth and the content of organic matter. Crops respond well to systematic applications of lime and fertilizer.

This soil is well suited to pasture and hay, and it has few limitations for these uses. Coastal bermudagrass and bahiagrass are the most common grasses grown (fig. 8). Proper stocking rates, pasture rotation, and restricted grazing during prolonged wet or dry periods help to keep the pasture in good condition. Applications of lime and fertilizer improve soil fertility and increase the production of forage.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of little bluestem, flowering dogwood, greenbrier, yellow jessamine, panicums, oak, and hickory.

This soil has few limitations affecting the production of timber. Soil compaction and plant competition are minor management concerns. Harvesting during the drier periods helps to prevent compaction. Carefully managed reforestation helps to control competition from undesirable understory plants. Site preparation practices, such as chopping, burning, and applying herbicides, help to control initial plant competition and facilitate mechanical planting.

This map unit is well suited to most urban uses. It has moderate limitations for building sites, slight limitations for local roads and streets, and severe limitations for most kinds of sanitary facilities. The main limitations are wetness and the moderately slow permeability. A subsurface drainage system reduces the wetness. Septic tank absorption fields will not function properly during rainy periods because of the wetness and the moderately slow permeability. Enlarging the size of the absorption field helps to overcome these limitations.

This map unit has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey. Habitat for openland wildlife can be improved by leaving undisturbed areas of vegetation around cropland and pasture to provide food and resting areas for red fox, rabbits, quail, and songbirds.

This Malbis soil is in capability subclass IIe. The woodland ordination symbol is 9A.

Figure 8.—An area of Malbis fine sandy loam, 1 to 3 percent slopes. This soil is well suited to the production of hay. Most areas of this soil were once used for cultivated crops, such as cotton and soybeans, but are now used for pasture, hay, or woodland.

MbC—Malbis fine sandy loam, 5 to 8 percent slopes

This very deep, well drained soil is on side slopes in the uplands. Slopes are generally short and complex. They range in length from 75 to 200 feet. Individual areas are generally long and narrow. They range from 10 to 150 acres in size.

Typically, the surface layer is yellowish brown fine sandy loam about 6 inches thick. The subsoil, to a depth of 72 inches, is strong brown sandy clay loam in the upper part and yellowish brown sandy clay loam that has reddish mottles and plinthite in the lower part.

Important properties of the Malbis soil—

Permeability: Moderately slow
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Perched, at a depth of 2.5 to 4.0 feet from December through March
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Luverne and Smithdale soils. Luverne and Smithdale soils are on the lower parts of slopes. Luverne soils have a clayey subsoil. Smithdale soils have a reddish subsoil. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for cultivated crops, pasture, or hay. Many small areas are used as woodland.

This soil is suited to cultivated crops. The main limitations are the low fertility, the short, complex slopes, and the severe hazard of erosion. Terraces, contour farming, minimum tillage, and cover crops reduce the runoff rate and help to control erosion. Using a sod-based rotation system and incorporating crop residue into the soil increase the content of organic matter and improve tilth. Drop-inlet structures, installed in grassed waterways, help to prevent gullying. Crops respond well to systematic applications of fertilizer and lime.

This soil is well suited to pasture and hay. Bahiagrass and coastal bermudagrass are the commonly grown grasses. The main management concerns are the low fertility and the severe hazard of erosion. The seedbed should be prepared on the contour or across the slope if practical. Proper stocking rates, pasture rotation, and restricted grazing during prolonged wet or dry periods help to keep the pasture in good condition. Applications of lime and fertilizer improve soil fertility and increase production of forage.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of little bluestem, flowering dogwood, greenbrier, yellow jessamine, panicums, oak, and hickory.

This soil has few limitations affecting woodland management; however, soil compaction and plant competition are minor management concerns. Harvesting during the drier periods helps to prevent soil compaction. Carefully managed reforestation helps to control competition from undesirable understory plants. Proper site preparation practices, such as chopping, burning, and applying herbicide, help to control the initial plant competition and facilitate mechanical planting. Management activities should include conservation practices to control soil erosion. Roads and landings can be protected from erosion by constructing diversions and by seeding cuts and fills.

This soil is suited to most urban uses. It has moderate limitations for building sites, slight limitations for local roads and streets, and severe limitations for most kinds of sanitary facilities. The main limitations are the slope, the wetness, and the moderately slow permeability. A subsurface drainage system reduces the wetness. Septic tank absorption fields will not function properly during rainy periods because of the wetness and the moderately slow permeability. Enlarging the size of the absorption field helps to overcome these limitations. Absorption lines should be constructed on the contour.

This map unit has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat for deer, turkey, and squirrel can be improved by planting or encouraging the growth of existing oak trees and suitable understory plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey. Habitat for openland wildlife can be improved by leaving undisturbed areas of vegetation around cropland and pasture to provide food and resting areas for red fox, rabbits, quail, and songbirds.

This Malbis soil is in capability subclass IIIe. The woodland ordination symbol is 9A.

MIA—Mantachie, Bibb, and Iuka soils, 0 to 1 percent slopes, frequently flooded

This map unit consists of the very deep, somewhat poorly drained Mantachie soils, the poorly drained Bibb soils, and the moderately well drained Iuka soils on flood plains. The soils are subject to flooding for brief periods several times each year (fig. 9). The composition of this map unit is variable, but the mapping was sufficiently controlled to evaluate the soils for the expected uses. Some areas consist mainly of the Mantachie soil, some areas consist mainly of Iuka or Bibb soils, and other areas contain all three soils in variable proportions. Individual areas are usually long and narrow. They range from 5 to more than 500 acres in size.

The Mantachie soil makes up about 35 percent of the map unit. This soil is in smooth, slightly convex positions at intermediate elevations on the flood plain. Typically, the surface layer is dark grayish brown loam about 3 inches thick. The subsoil, to a depth of 60 inches, is mottled brownish and grayish loam in the upper part and gray clay loam in the lower part.

Important properties of the Mantachie soil—

Permeability: Moderate
Available water capacity: High
Organic matter content: Medium
Natural fertility: Medium
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Apparent, at a depth of 1.0 to 1.5 feet from December through April
Shrink-swell potential: Low
Flooding: Frequent

The Bibb soil makes up about 30 percent of the map unit. This soil is in flat to concave positions, generally at the lowest elevations on the flood plain. Typically, the surface layer is dark gray and very dark gray loam about 16 inches thick. The substratum, to a depth of 60 inches, is dark gray, light gray, and gray sandy loam.

Figure 9.—Flooding is a limitation for most uses in areas of Mantachie, Bibb, and Iuka soils, 0 to 1 percent slopes, frequently flooded.

Important properties of the Bibb soil—

Permeability: Moderate
Available water capacity: Moderate
Organic matter content: Medium
Natural fertility: Medium
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Apparent, at a depth of 0.5 to 1.0 foot from December through April
Shrink-swell potential: Low
Flooding: Frequent

The Iuka soil makes up about 25 percent of the map unit. This soil is on the higher, more convex parts of the flood plain. Typically, the surface layer, to a depth of 12 inches, is brown loam in the upper part and dark yellowish brown sandy loam in the lower part. The substratum, to a depth of 60 inches, is brown loam and yellowish brown sandy loam in the upper part; light brownish gray sandy loam in the next part; and grayish brown loamy sand in the lower part. Mottles in shades of yellow, brown, and gray are common throughout the profile.

Important properties of the Iuka soil—

Permeability: Moderate
Available water capacity: Moderate
Organic matter content: Medium
Natural fertility: Medium
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Apparent, at a depth of 1.0 to 3 feet from December through April

Shrink-swell potential: Low
Flooding: Frequent

Included in mapping are a few small areas of Bigbee, Cahaba, and Eunola soils. The excessively drained Bigbee soils, the well drained Cahaba soils, and the moderately well drained Eunola soils are on low knolls or on remnants of terraces at slightly higher elevations. They are not subject to frequent flooding. Also included are small areas of very poorly drained soils in depressions that are subject to ponding. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this map unit are wooded and are used for wildlife habitat. A few areas are used for pasture, hay, and cultivated crops.

This map unit is poorly suited to most cultivated crops. The frequent flooding and the wetness are the main limitations. If cultivated crops are grown, a surface drainage system and protection from flooding are needed.

This map unit is poorly suited to pasture and hay because of the frequent flooding and wetness. If areas are used for pasture or hay, grasses that tolerate the wet soil conditions should be selected. Common bermudagrass is a suitable grass to plant. Shallow ditches help to remove excess water from the surface.

This map unit is suited to loblolly pine, slash pine, and hardwoods. Other species that commonly grow in areas of this map unit include American sycamore, yellow poplar, water oak, green ash, and sweetgum. On the basis of a 50-year site curve, the mean site index for loblolly pine is 100 for the Mantachie soil and 105 for the Iuka soil. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.7 cords per acre per year for the Mantachie soil and 2.9 cords per acre per year for the Iuka soil. On the basis of a 50-year site curve, the mean site index for water oak is 90 for the Bibb soil. The average annual growth of well stocked, even-aged, unmanaged stands of water oak at 30 years of age is 1 cord per acre per year. The understory vegetation consists mainly of sweetgum, blackgum, panicums, sweetbay, green ash, yellow poplar, and red maple.

This map unit has severe limitations for the management of timber. The main limitations are the restricted use of equipment, the seedling mortality rate, and plant competition. The seasonal high water table and the flooding restrict the use of equipment to periods when the soils are dry. Using standard wheeled and tracked equipment when the soils are wet results in rutting and compaction. Using low-pressure ground equipment reduces damage to the soils and helps to maintain productivity. The high seedling mortality rate of the Bibb and Mantachie soils is caused by excessive wetness. It can be reduced by planting on beds and increasing the tree planting rate. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial plant competition, and herbicides can be used to control the subsequent growth.

This map unit is not suited to most urban uses. The flooding and wetness are severe limitations for most uses. Although it is generally not feasible to control flooding, buildings can be placed on pilings or on well-compacted fill to elevate them above the expected flood level.

The Mantachie and Iuka soils have fair potential as habitat for openland wildlife and good potential as habitat for woodland wildlife. The Bibb soil has poor potential as habitat for openland and woodland wildlife. The potential as habitat for wetland wildlife is fair for the Mantachie and Bibb soils and is poor for the Iuka soil. Habitat for openland and woodland wildlife can be improved by planting or encouraging the growth of existing oak trees and suitable understory plants. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

The Mantachie, Bibb, and Iuka soils are in capability subclass Vw. The woodland ordination symbol is 11W for the Mantachie soil, 6W for the Bibb soil and 12W for the Iuka soil.

OkC2—Oktibbeha clay loam, 5 to 10 percent slopes, eroded

This very deep, moderately well drained soil is on side slopes and narrow ridgetops in the northwest corner of the county. In most areas, the surface layer is a mixture of the original surface layer and material from the subsoil. In some places, all of the original surface layer has been removed. Some areas have a few rills and shallow gullies. Slopes are generally short and complex. They range in length from 50 to 200 feet. Individual areas are irregular in shape. They range from 10 to about 150 acres in size.

Typically, the surface layer is dark brown clay about 4 inches thick. The subsoil, to a depth of 40 inches, is red clay in the upper part and yellowish red clay in the lower part. The substratum, to a depth of 60 inches, is yellowish brown, alkaline clay.

Important properties of the Oktibbeha soil—

Permeability: Very slow
Available water capacity: Moderate
Organic matter content: Low
Natural fertility: Medium
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Very high
Flooding: None

Included in mapping are a few small areas of Sumter and Watsonia soils. Sumter and Watsonia soils are in slightly higher positions than the Oktibbeha soil. Sumter soils are alkaline throughout, and they have soft limestone bedrock within a depth of 20 to 40 inches. Watsonia soils have soft limestone bedrock within a depth of 10 to 20 inches. Included soils make up about 10 percent of the unit, but individual areas are less than 5 acres in size.

Most areas of this soil are used for pasture and woodland. A few areas are used for hay or cultivated crops.

This soil is poorly suited to cultivated crops. The main management concerns are the slope, the poor tilth, and the severe hazard of erosion. Measures that control erosion include early-fall seeding, minimum tillage, terraces, diversions, and grassed waterways. Tillage should be on the contour or across the slope.

This soil is suited to pasture and hay. The main management concerns are the slope and the severe hazard of erosion. The seedbed should be prepared on the contour or across the slope if practical. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Applications of lime and fertilizer improve fertility and increase the production of forage.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include eastern redcedar, hackberry, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of greenbrier, blackberry, panicums, American beautyberry, longleaf uniola, poison ivy, and honeysuckle.

This soil has moderate or severe limitations for the management of timber. The main limitations are the restricted use of equipment, the seedling mortality rate, and plant competition. Exposing the surface by removing ground cover increases the hazard of erosion, and exposed soil surfaces are subject to rill and gully erosion. Roads, landings, and skid trails can be protected against erosion by constructing diversions, mulching, and seeding. The low strength of the clayey subsoil restricts the use of equipment to periods when the soil is dry. Using low-pressure ground equipment reduces damage to the soil and helps to maintain productivity. The high seedling mortality rate is caused by droughtiness and the high clay content of the surface layer. It can be compensated for by increasing the number of trees planted. Planting on raised beds or subsoiling help to increase the survival of seedlings. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial plant competition, and herbicides can be used to control the subsequent growth.

This soil is poorly suited to most urban uses. It has severe limitations for building sites, local roads and streets, and most kinds of sanitary facilities. The main limitations are the very slow permeability, the slope, the very high shrink-swell potential, and the low strength on sites for roads and streets. If excavations are made, the cutbanks cave easily. Properly designing foundations and footings and diverting runoff away from the buildings help to prevent the structural damage that results from shrinking and swelling. Septic tank absorption fields will not function properly during rainy periods because of the very slow permeability. An alternative system of sewage disposal should be used to dispose of sewage properly. Maintaining the existing plant cover during construction helps to control erosion.

This soil has good potential as habitat for woodland wildlife, fair potential as habitat for openland wildlife, and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Oktibbeha soil is in capability subclass IVe. The woodland ordination symbol is 9C.

OrB—Orangeburg sandy loam, 1 to 5 percent slopes

This very deep, well drained soil is on ridgetops and on the upper parts of side slopes in the uplands. Slopes are generally long and smooth. They range in length from 150 to 450 feet. Individual areas are irregular in shape. They range from 5 to 300 acres in size.

Typically, the surface layer, to a depth of 13 inches, is dark brown sandy loam in the upper part and yellowish brown sandy loam in the lower part. The subsoil, to a depth of 75 inches, is yellowish red sandy clay loam in the upper part and red sandy clay loam in the lower part. In a few areas, the surface layer is loamy sand.

Important properties of the Orangeburg soil—

Permeability: Moderate
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches

Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Greenville, Lucy, Luverne, and Malbis soils. Greenville soils are in landscape positions similar to those of the Orangeburg soil. They have a dark red, clayey subsoil. Luverne and Malbis soils are in slightly lower landscape positions than the Orangeburg soil. Luverne soils have a clayey subsoil. Malbis soils have yellowish brown colors in the subsoil. Lucy soils are in slightly higher landscape positions than the Orangeburg soil, and they have thick sandy surface and subsurface layers. Included soils make up about 10 percent of the map unit, but individual areas generally are less than 5 acres in size.

Most areas of this soil are used for cultivated crops, pasture, or hay. A few areas are used as sites for homes, and a few areas are wooded.

This soil is well suited to cultivated crops. The main limitations are the low fertility and the moderate hazard of erosion. Gullies form readily in areas that have a concentrated flow of water on the surface. Conservation tillage, terraces, contour farming, and cover crops reduce the runoff rate and help to control erosion (fig. 10). Using minimum tillage and returning all crop residue to the soil or regularly adding other organic matter improve fertility and help to maintain tilth and the content of organic matter. Most crops respond well to additions of lime and fertilizer.

This soil is well suited to pasture and hay. The main limitations are the low fertility and the moderate hazard of erosion. Coastal bermudagrass and bahiagrass are the commonly grown grasses. Tillage should be on the contour or across the slope. Proper stocking rate, pasture rotation, and restricted grazing during prolonged wet and dry periods help to keep the pasture in good condition. Applications of lime and fertilizer improve soil fertility and promote the good growth of forage plants.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, shortleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.1 cords per acre per year. The understory vegetation consists mainly of little bluestem, panicums, sumac, yellow jessamine, huckleberry, greenbrier, and flowering dogwood.

This soil has few limitations affecting woodland management; however, competition from understory plants is a minor management concern. Carefully managed reforestation helps to control competition from undesirable understory plants. Site preparation practices, such as chopping, burning, and applying herbicide, help to control the initial plant competition and facilitate mechanical planting.

This soil is well suited to most urban uses, and it has no significant limitations for these uses.

This soil has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Orangeburg soil is in capability subclass IIe. The woodland ordination symbol is 8A.

OrC—Orangeburg sandy loam, 5 to 8 percent slopes

This very deep, well drained soil is on narrow ridgetops and on side slopes of the uplands. Slopes are generally short and complex, but they may be long and smooth in some areas. They range in length from 75 to 350 feet. Individual areas are irregular in shape. They range from 5 to more than 200 acres in size.

Typically, the surface layer is brown sandy loam about 8 inches thick. The subsurface layer, to a depth of 17 inches, is brownish yellow sandy loam. The subsoil, to a depth of 72 inches, is yellowish red sandy clay loam.

Important properties of the Orangeburg soil—

Permeability: Moderate
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Lucy, Luverne, and Smithdale soils. Lucy soils are on slightly higher parts of ridges, and they have thick sandy surface and subsurface layers. Luverne and Smithdale soils are on the lower parts of slopes. Luverne soils are clayey in the upper part of the subsoil. The subsoil of the Smithdale soils has a significant decrease in the content of clay within a depth of 60 inches. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for cultivated crops,

Figure 10.—An area of Orangeburg sandy loam, 1 to 5 percent slopes. Planting row crops on the contour is a conservation practice used to control erosion in areas of this soil.

pasture, or hay. Some areas are wooded, and a few areas are used as sites for homes.

This soil is suited to cultivated crops. The main limitations are the short, complex slopes, the low fertility, and a severe hazard of erosion. Gullies form readily in areas that have a concentrated flow of water on the surface. Sheet and rill erosion are evident in most areas, and large gullies are common. Conservation tillage, terraces, contour farming, and cover crops reduce the runoff rate and help to control erosion. Drop-inlet structures, installed in grassed waterways, help to prevent gullying. Returning all crop residue to the soil or regularly adding other organic matter improves fertility and helps to maintain tilth and the content of organic matter. Most crops respond well to additions of lime and fertilizer.

This soil is well suited to pasture and hay. The main limitations are the low fertility and the severe hazard of erosion. Grasses such as coastal bermudagrass and bahiagrass are well suited. Tillage should be on the contour or across the slope if practical. Proper stocking rates, pasture rotation, and restricted grazing during prolonged wet and dry periods help to keep the pasture in good condition. Applications of lime and fertilizer improve soil fertility and promote the good growth of forage plants.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, shortleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.1 cords per acre per year. The understory vegetation consists mainly of little bluestem, panicums, sumac, greenbrier, huckleberry, and flowering dogwood.

This soil has few limitations affecting woodland management; however, competition from understory plants is a minor management concern. Carefully managed reforestation helps to control competition from undesirable understory plants. Site preparation practices, such as chopping, burning, and applying herbicide, help to control the initial plant competition and facilitate mechanical planting.

This soil is well suited to most urban uses. It has slight limitations for most uses; however, the hazard of erosion is a concern. Only the part of the site that is used for construction should be disturbed.

This soil has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Orangeburg soil is in capability subclass IIIe. The woodland ordination symbol is 8A.

OuC—Orangeburg-Urban land complex, 2 to 8 percent slopes

This map unit consists of the very deep, well drained Orangeburg soil and areas of Urban land. The areas are so intricately intermingled that they could not be mapped separately at the scale selected for mapping. The Orangeburg soil makes up about 50 percent of the map unit, and the Urban land makes up about 40 percent. Individual areas are rectangular in shape. They range from 10 to more than 100 acres in size.

Typically, the surface layer of the Orangeburg soil is dark grayish brown sandy loam about 6 inches thick. The subsoil, to a depth of 72 inches, is yellowish red and red sandy clay loam.

Important properties of the Orangeburg soil—

Permeability: Moderate
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Urban land consists of areas that are covered by sidewalks, patios, driveways, parking lots, streets, playgrounds, and buildings.

Included in mapping are a few small areas of Lucy and Luverne soils. Also included are areas of soils that have been manipulated to such an extent that the soil series cannot be identified. Lucy soils are in slightly higher landscape positions than the Orangeburg soil. They have thick sandy surface and subsurface layers. Luverne soils are in slightly lower landscape positions than the Orangeburg soil, and they have a clayey subsoil. Included soils make up about 10 percent of the map unit, but individual areas generally are less than 5 acres in size.

Areas of the Orangeburg soil cannot be easily managed for crops, pasture, or timber or as wildlife habitat because of the limited size of the areas, the intermittent areas of Urban land, and areas of highly disturbed soils.

Areas of Orangeburg soil are well suited to most urban uses. The soil has no significant limitations for these uses.

This map unit is not assigned to a capability subclass or a woodland ordination symbol.

Pt—Pits

This map unit consists of open excavations from which the original soil and underlying material has been removed for use at another location. Pits are scattered throughout the county. Individual areas are generally rectangular in shape and range from 2 to 25 acres in size.

In upland areas, this map unit has provided a source of material for constructing highways and foundations and has provided fill material. Pits in the uplands are mainly in areas of Alaga, Greenville, Lucy, Orangeburg, Smithdale, and Troup soils. The soils have been removed to a depth of 5 to 25 feet. On stream terraces, this map unit has provided a source of sand and gravel. Pits on stream terraces are mainly in areas of Bonneau, Cahaba, and Eunola soils. The soils have been removed to a depth of 5 to 15 feet.

Included in mapping are areas of abandoned pits. These areas consist of pits and spoil banks that are 10 to 25 feet high. The surface of these areas generally is a mixture of coarse sand and gravel. Reaction is extremely acid or very strongly acid.

Most areas of this map unit support no vegetation. A few low-quality trees and sparse stands of grass are in some of the abandoned pits. This map unit is unsuited to most uses. Extensive reclamation efforts are required to make areas suitable for use as cropland, pasture, or woodland or for urban uses. Onsite investigation and testing is needed to determine the suitability of this unit for any uses.

This miscellaneous area is in capability subclass VIIIs. It is not assigned a woodland ordination symbol.

RaA—Rains sandy loam, 0 to 2 percent slopes

This very deep, poorly drained soil is in flat or depressional areas on broad ridgetops of the uplands. Slopes are smooth and concave. Individual areas are generally circular or oblong in shape. They range from 3 to about 100 acres in size.

Typically, the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsoil, to a depth of 60 inches, is light gray sandy clay loam in the upper part and light brownish gray sandy clay loam in the lower part.

Important properties of the Rains soil—

Permeability: Moderate
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Apparent, at a depth of 0 to 1.0 foot from December through April
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Lynchburg soils. The somewhat poorly drained Lynchburg soils are in slightly higher, more convex landscape positions than the Rains soil. Also included are small areas of Rains soils in depressions that are ponded for long periods during the growing season. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used for woodland and pasture. A few areas are used for cultivated crops and hay.

This soil is poorly suited to cultivated crops, pasture, and hay. Wetness is the main limitation. If cultivated crops are grown, a surface drainage system is needed. If areas are used for pasture or hay, grasses that tolerate wet soil conditions should be selected. Common bermudagrass is a suitable grass to plant.

This soil is suited to loblolly pine, slash pine, and hardwoods. Other species that commonly grow in areas of this soil include water oak, sweetgum, and green ash. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of panicums, red maple, waxmyrtle, green ash, water oak, and greenbrier.

This soil has severe limitations for the management of timber. The main limitations are the restricted use of equipment, the seedling mortality rate, and plant competition. The seasonal high water table restricts the use of equipment to periods when the soil is dry. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Using low-pressure ground equipment reduces damage to the soil and helps to maintain productivity. The high seedling mortality rate is caused by excessive wetness. It can be reduced by planting on beds, or it can be compensated for by increasing the number of trees planted. Competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial plant competition, and herbicides can be used to control the subsequent growth.

This soil is poorly suited to most urban uses. It has severe limitations for building sites, local roads and streets, and most kinds of sanitary facilities. The major limitation is wetness. A surface and subsurface drainage system should be provided if buildings are constructed. Septic tank absorption fields will not function properly during rainy periods because of wetness. Constructing the absorption field on a raised bed helps to overcome the high water table.

This soil has good potential as habitat for woodland and wetland wildlife and fair potential as habitat for openland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

This Rains soil is in capability subclass IIIw. The woodland ordination symbol is 9W.

RbA—Rains-Bethera complex, 0 to 1 percent slopes, occasionally flooded

This map unit consists of the very deep, poorly drained Rains and Bethera soils on low terraces adjacent to major streams throughout the county. These soils are subject to occasional flooding, usually in late winter and early spring. They occur as areas so intricately intermingled that they cannot be mapped separately at the scale selected for mapping. The Rains soil makes up about 50 percent of the map unit, and the Bethera soil makes up about 35 percent. Most mapped areas are long and narrow, but some are broad. They range from 10 to 800 acres in size.

The Rains soil is on slightly higher parts of low terraces. Typically, the surface layer is dark gray sandy loam about 7 inches thick. The subsurface layer, to a depth of 11 inches, is light brownish gray sandy loam. The subsoil, to a depth of 72 inches, is light gray sandy clay loam in the upper part; grayish brown sandy clay loam in the next part; and gray sandy clay loam and clay loam in the lower part. This soil has many or common mottles in shades of brown, yellow, and red throughout the profile.

Important properties of the Rains soil—

Permeability: Moderate
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Apparent, at a depth of 0 to 1.0 foot from December through April
Shrink-swell potential: Low
Flooding: Occasional

The Bethera soil is on slightly lower parts of low terraces. Typically, the surface layer is dark grayish brown fine sandy loam about 6 inches thick. The subsoil, to a depth of 72 inches, is grayish brown clay loam and clay in the upper part; gray clay in the next part; and grayish brown clay in the lower part. This soil has many or common mottles in shades of brown, yellow, and red throughout the profile.

Important properties of the Bethera soil—

Permeability: Slow
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Apparent, at a depth of 0 to 1.5 feet from December through April
Shrink-swell potential: Moderate
Flooding: Occasional

Included in mapping are a few small areas of Eunola, Lynchburg, and Mantachie soils. The moderately well drained Eunola soils and the somewhat poorly drained Lynchburg soils are in slightly higher, more convex landscape positions than Rains and Bethera soils. The somewhat poorly drained Mantachie soils are in slightly lower positions on flood plains. Included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this map unit are used as woodland and as wildlife habitat. A few small areas are used for pasture.

This map unit is poorly suited to cultivated crops, pasture, and hay. The wetness and occasional flooding are the main limitations. If cultivated crops are grown, a surface drainage system and protection from flooding are needed. If areas are used for pasture or hay, grasses that tolerate wet soil conditions should be selected. Common bermudagrass is a suitable pasture grass to plant.

This map unit is suited to loblolly pine, slash pine, and hardwoods. Other species that commonly grow in areas of this map unit include sweetgum, water oak, and green ash. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90 for both the Rains and Bethera soils. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.2 cords per acre per year. The understory vegetation consists mainly of red maple, water oak, green ash, sweetgum, panicums, waxmyrtle, greenbrier, and blackberry.

This map unit has severe limitations for the management of timber. The main limitations are the restricted use of equipment, the seedling mortality rate, and plant competition. The seasonal high water table and the flooding restrict the use of equipment to periods when the soil is dry. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Using low-pressure ground equipment reduces damage to the soil and helps to maintain productivity. The high seedling mortality rate is caused by excessive wetness. It can be reduced by planting on beds (fig. 11), or it can be compensated for by increasing the number of trees planted. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial plant competition, and herbicides can be used to control the subsequent growth.

This map unit is poorly suited to most urban uses. It has severe limitations for building sites, local roads and streets, and most kinds of sanitary facilities. The main limitations are the wetness and occasional flooding. Although it is generally not feasible to control the flooding, buildings can be placed on pilings or mounds to elevate them above the expected flood level.

This map unit has good potential as habitat for wetland wildlife and fair potential as habitat for woodland and openland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearing animals.

The Rains and Bethera soils are in capability subclass IVw. The woodland ordination symbol is 9W.

SeC2—Searcy sandy clay loam, 2 to 8 percent slopes, eroded

This very deep, moderately well drained soil is on side slopes and toe slopes of the uplands in the northwest corner of the county. In most areas, the surface layer is a mixture of the original surface layer and material from the subsoil. In some places, all of the original surface layer has

Figure 11.—An area of Rains-Bethera complex, 0 to 1 percent slopes, occasionally flooded. Planting loblolly pine trees on raised beds is a common management practice in areas of these poorly drained soils.

been removed. Most areas have a few rills and gullies. Slopes are generally short and complex. They range in length from 50 to 200 feet. Individual areas are irregular in shape. They range from 10 to 100 acres in size.

Typically, the surface layer is brown sandy clay loam about 3 inches thick. The subsoil, to a depth of 65 inches, is yellowish red clay loam and red clay in the upper part; mottled red, light brownish gray, and yellowish brown clay in the next part; and mottled strong brown, yellowish brown, and gray clay in the lower part.

Important properties of the Searcy soil—

Permeability: Slow
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Perched, at a depth of 2.0 to 3.5 feet from December through March
Shrink-swell potential: Moderate
Flooding: None

Included in mapping are a few small areas of Brantley, Demopolis, and Oktibbeha soils. Also included are small areas of severely eroded soils. Brantley soils are in landscape positions similar to those of the Searcy soil. They are well drained and have a thinner solum than the Searcy soil. Demopolis soils are on slightly higher knolls. They are shallow over soft limestone bedrock. Oktibbeha soils are on lower parts of slopes. They have vertic properties in the upper part of the subsoil. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this soil are used as woodland or pasture. A few areas are used for cultivated crops or hay.

This soil is suited to cultivated crops. The main management concerns are the low fertility, the poor tilth, and the severe hazard of erosion. The surface layer of this soil is friable, but it is difficult to keep in good tilth where cultivation has mixed some of the clayey subsoil into the plow layer. Terraces, contour farming, minimum tillage, and cover crops reduce the runoff rate and help to control erosion. Drop-inlet structures, installed in grassed waterways, help to prevent gullying. Using a sod-based rotation system and incorporating crop residue into the soil increase the content of organic matter and improve tilth. Most crops respond well to systematic applications of lime and fertilizer.

This soil is well suited to pasture and hay. Erosion is a hazard when the soil surface is bare during the establishment of pasture. Tillage should be on the contour or across the slope to reduce soil losses. Proper stocking rates, pasture rotation, and restricted grazing during prolonged wet or dry periods help to keep the pasture and soil in good condition. Applications of lime and fertilizer improve fertility and increase the production of forage.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, shortleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 105. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.9 cords per acre per year. The understory vegetation consists mainly of little bluestem, panicums, greenbrier, poison ivy, huckleberry, muscadine grape, waxmyrtle, and flowering dogwood.

This map unit has moderate limitations for the management of timber. The main limitations are the restricted use of equipment, the seedling mortality rate, and plant competition. The clayey texture of the surface layer and subsoil restricts the use of equipment, especially when the soil is wet. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Using low-pressure ground equipment reduces damage to the soil and helps to maintain productivity. The moderate rate of seedling mortality is caused by the clayey texture of the surface layer. It can be compensated for by increasing the number of trees planted. Planting on raised beds or subsoiling will increase the rate of seedling survival. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial plant competition, and herbicides can be used to control the subsequent growth.

This soil is poorly suited to most urban uses. It has moderate limitations for building sites and severe limitations for local roads and streets and for most kinds of sanitary facilities. The main limitations are the moderate shrink-swell potential, the slow permeability, the wetness, and the low strength when used as sites for roads or streets. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. Roads and street should be designed to offset the limited ability of this soil to support a load. Septic tank absorption fields may not function properly because of the slow permeability and the seasonal high water table. Enlarging the size of the absorption field or using an alternative method of waste disposal helps to overcome these limitations.

This soil has good potential as habitat for openland and woodland wildlife and poor potential as habitat for wetland wildlife. Habitat for deer, turkey, and squirrel can be improved by planting or encouraging the growth of existing oak trees and suitable understory plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

This Searcy soil is in capability subclass IIIe. The woodland ordination symbol is 12C.

SeD3—Searcy sandy clay loam, 8 to 15 percent slopes, severely eroded

This very deep, moderately well drained soil is on side slopes and toe slopes of the uplands in the northwest corner of the county. In most areas, the surface layer is a mixture of the original surface layer and material from the subsoil. In places, all of the original surface layer has been removed. Most areas have common to many rills and deep gullies. Slopes are generally short and complex. They range in length from 50 to 150 feet. Individual areas are irregular in shape and range from 25 to 150 acres in size.

Typically, the surface layer is very dark gray sandy clay loam about 5 inches thick. The subsoil, to a depth of 65 inches, is dark brown sandy clay loam in the upper part; red and yellowish red clay that has gray and yellowish brown mottles in the next part; and mottled yellowish brown, gray, and red clay in the lower part. In a few places, the surface layer is loam or fine sandy loam.

Important properties of the Searcy soil—

Permeability: Slow
Available water capacity: High

Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: Perched, at a depth of 2.0 to 3.5 feet from December through March
Shrink-swell potential: Moderate
Flooding: None

Included in mapping are a few small areas of Brantley, Demopolis, and Oktibbeha soils. The Brantley soils are in landscape positions similar to those of the Searcy soil. They are well drained and have a thinner solum than the Searcy soil. Demopolis soils are on slightly higher knolls and are shallow over soft limestone bedrock. Oktibbeha soils are on the lower parts of slopes and have vertic properties. Included soils make up about 15 percent of the unit, but individual areas are less than 5 acres in size.

Most areas of this soil are used as woodland. A few areas are used for pasture and hay.

This soil is unsuited to most cultivated crops. The complex topography, deep gullies, and the moderately sloping to moderately steep slopes are severe limitations for the use of equipment. Erosion is a severe hazard. Gullies form readily in areas that have a concentrated flow of water on the surface. If the soil is cultivated, all tillage should be on the contour or across the slope.

This soil is poorly suited to pasture and hay. The complex slope, deep gullies, and the severe hazard of erosion are the main limitations. The use of equipment is limited by the sloping, complex topography and deep gullies. Tillage should be on the contour or across the slope if practical. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Applications of lime and fertilizer improve soil fertility and promote the good growth of forage plants.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, shortleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 105. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.9 cords per acre per year. The understory vegetation consists mainly of little bluestem, panicums, greenbrier, poison ivy, huckleberry, muscadine grape, waxmyrtle, and flowering dogwood.

This soil has moderate limitations for the management of timber. The main limitations are the hazard of erosion, the equipment limitations, the seedling mortality rate, and plant competition. Exposing the surface by removing ground cover increases the hazard of erosion. Exposed soil surfaces are subject to rill and gully erosion. Roads, landings, and skid trails can be protected against erosion by constructing diversions, mulching, and seeding. The slope and deep gullies restrict the use of equipment. Using standard wheeled and tracked equipment when the soil is wet results in rutting and compaction. Management activities should be conducted during seasons of the year when the soil is dry. The moderate rate of seedling mortality is caused by the clayey texture of the surface layer. It can be compensated for by increasing the number of trees planted. Planting on raised beds or subsoiling will increase the rate of seedling survival. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation. The competing vegetation can be controlled by mechanical methods, herbicides, or prescribed fire.

This soil is poorly suited to most urban uses. It has moderate limitations for building sites and severe limitations for local roads and streets and for most kinds of sanitary facilities. The main limitations are the slope, the moderate shrink-swell potential, the slow permeability, the wetness, and low strength if used for roads and streets. Erosion is a hazard in the steeper areas. Only the part of the site that is used for construction should be disturbed. Access roads can be designed so that surface runoff is controlled and cut slopes are stabilized. Roads should also be designed to offset the limited ability of this soil to support a load. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. Septic tank absorption fields may not function properly because of the seasonal high water table and the slow permeability. Alternative methods of sewage disposal should be used to properly dispose of waste.

This map unit has good potential as habitat for openland and woodland wildlife and poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

This Searcy soil is in capability subclass VIe. The woodland ordination symbol is 12C.

SmD—Smithdale sandy loam, 8 to 15 percent slopes

This very deep, well drained soil is on side slopes and narrow ridges in the uplands. Deeply incised, intermittent drainageways dissect the unit in most places. Slopes are generally short and complex. They range in length from 25 to 150 feet. Individual areas are irregular in shape. They range from 10 to 300 acres in size.

Typically, the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsurface layer, to a depth of 11 inches, is yellowish red sandy loam. The subsoil, to a depth of 72 inches, is red sandy clay loam in the upper part and red sandy loam in the lower part.

Important properties of the Smithdale soil—

Permeability: Moderate in the upper part of the subsoil; moderately rapid in the lower part
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Bibb, Lucy, Luverne, Orangeburg, and Troup soils. The poorly drained Bibb soils are on narrow flood plains. Lucy and Orangeburg soils are on narrow ridgetops. Lucy soils have thick sandy surface and subsurface layers. Orangeburg soils do not have a significant decrease in clay content within a depth of 60 inches. Luverne and Troup soils are in landscape positions similar to those of the Smithdale soil. Luverne soils have a clayey subsoil. Troup soils have thick sandy surface and subsurface layers. Also included are areas of soils on slopes of less than 8 percent and on slopes of more than 15 percent. Included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this map unit are used as woodland. A few areas are used for pasture or hay.

This soil is poorly suited to most cultivated crops. The complex topography and the moderately sloping to moderately steep slopes are limitations for the use of equipment. Erosion is a severe hazard. Gullies form readily in areas where the flow of water is concentrated. Drop-inlet structures, installed in grassed waterways, help to prevent the formation of gullies. If the soil is cultivated, all tillage should be on the contour or across the slope.

This soil is suited to pasture and hay. The main limitations are the slope and the severe hazard of erosion. The use of equipment is restricted by the sloping, complex topography. The seedbed should be prepared on the contour or across the slope if practical. Proper stocking rates, pasture rotation, and restricted grazing during very wet or dry periods help to keep the pasture in good condition.

This soil is well suited to loblolly pine and slash pine. Other species that commonly grow in areas of this soil include longleaf pine, shortleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 2.1 cords per acre per year. The understory vegetation consists mainly of greenbrier, bracken fern, poison oak, little bluestem, panicums, muscadine grape, flowering dogwood, and sweetgum.

This soil has slight limitations for the management of timber. Exposing the surface by removing ground cover increases the hazard of erosion. Exposed soil surfaces are subject to rill and gully erosion. Roads, landings, and skid trails can be protected against erosion by constructing diversions, mulching, and seeding.

This soil is suited to most urban uses. It has moderate limitations for building sites, local roads and streets, and for most kinds of sanitary facilities. The main limitations are the slope and seepage. Erosion is a hazard in the steeper areas. Only the part of the site that is used for construction should be disturbed. Access roads can be designed so that surface runoff is controlled and cut slopes are stabilized. Effluent from absorption areas may surface in downslope areas and create a health hazard. Constructing the absorption lines on the contour and enlarging the absorption area help to overcome this limitation.

This map unit has good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

This Smithdale soil is in capability subclass IVe. The woodland ordination symbol is 8A.

SuD2—Sumter silty clay, 5 to 15 percent slopes, eroded

This moderately deep, well drained soil is on side slopes and narrow ridges of the uplands in the northwest corner of the county. In most areas, the surface layer is a mixture of the original surface and material from the subsoil. In some places, all of the original surface layer has been removed. Some areas have a few rills and shallow gullies. Slopes are generally short and complex. Individual areas are irregular in shape. They range from 10 to 50 acres in size.

Typically, the surface layer is grayish brown silty clay about 3 inches thick. The subsoil, to a depth of 26 inches, is light yellowish brown silty clay in the upper part and light yellowish brown silty clay loam in the lower part. The substratum, to a depth of 60 inches, is soft limestone (chalk) bedrock.

Important properties of the Sumter soil—

Permeability: Very slow
Available water capacity: Moderate
Organic matter content: Medium
Natural fertility: Medium
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Moderate
Flooding: None

Included in mapping are a few small areas of Demopolis, Oktibbeha, and Watsonia soils. Demopolis and Watsonia soils are on narrow ridges. They are shallow over bedrock. Oktibbeha soils are on the lower parts of slopes. They have a reddish subsoil and are acid in the upper part of the subsoil. Included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this map unit are used for pasture and woodland.

This soil is poorly suited to cultivated crops. The main limitations are the slope, poor tilth, and the severe hazard of erosion. The surface layer is difficult to keep in good tilth where cultivation has mixed some of the subsoil into the plow layer. Contour farming, minimum tillage, and cover crops reduce the runoff rate and help to control erosion. Using a sod-based rotation system and incorporating crop residue into the soil increase the content of organic matter and improve tilth.

This soil is suited to pasture and hay. Short, complex slopes and the severe hazard of erosion are the main limitations. The seedbed should be prepared on the contour or across the slope if practical. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This soil is suited to the production of eastern redcedar. It is generally not suited to the commercial production of pine trees because of alkaline materials within a depth of 20 inches. On the basis of a 50-year site curve, the site index for eastern redcedar is 40. The average annual growth of well stocked, even-aged, unmanaged stands of eastern redcedar at 40 years of age is 140 board feet per acre per year. The understory vegetation consists mainly of johnsongrass, honeylocust, hackberry, blackberry, panicums, Macartney rose, winged elm, honeysuckle, and Osage-orange.

This soil has moderate or severe limitations for the management of timber. The main limitations are the hazard of erosion, the restricted use of equipment, the seedling mortality rate, and plant competition. Exposing the surface by removing ground cover increases the hazard of erosion, and exposed soil surfaces are subject to rill and gully erosion. Roads, log landings, and skid trails can be protected against erosion by constructing diversions, mulching, and seeding. The clayey texture of the surface layer restricts the use of equipment when the soil is wet. Harvesting activities should be planned for the drier parts of the year. Using low-pressure ground equipment reduces damage to the soil and helps to maintain productivity.

This soil is poorly suited to most urban uses. It has severe limitations for building sites, local roads and streets, and most kinds of sanitary facilities. The main limitations are the slope, the depth to bedrock, the very slow permeability, and the moderate shrink-swell potential. Properly designing foundations and footings and diverting runoff away from the buildings help to prevent the structural damage that results from shrinking and swelling. Septic tank absorption fields will not function properly during rainy periods because of the very slow permeability. An alternative system of sewage disposal should be used to dispose of sewage properly. Maintaining the existing plant cover during construction helps to control erosion.

This soil has fair potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants.

This Sumter soil is in capability subclass VIe. The woodland ordination symbol is 3C.

TaD—Troup-Alaga complex, 5 to 15 percent slopes

This map unit consists of the very deep, somewhat excessively drained Troup and Alaga soils. It is on side slopes and narrow ridges in the uplands. The soils occur as areas so intricately intermingled that they could not be separated at the scale selected for mapping. The Troup soil makes up about 45 percent of the map unit, and the Alaga soil makes up about 40 percent. Slopes are generally short and complex, but they may be long and smooth in some areas. They range in length from 75 to 450 feet. Individual areas are irregular in shape. They range from 10 to 300 acres in size.

The Troup soil is generally on the upper parts of side slopes. Typically, the surface layer is dark brown loamy sand about 8 inches thick. The subsurface layer, to a depth of 50 inches, is yellowish red loamy sand. The subsoil, to a depth of 66 inches, is yellowish red sandy loam.

Important properties of the Troup soil—

Permeability: Rapid in the surface layer and subsurface layer; moderate in the subsoil
Available water capacity: Low
Organic matter content: Low
Natural fertility: Very low

Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

The Alaga soil is generally on the lower parts of side slopes. Typically, the surface layer is brown loamy sand about 4 inches thick. The substratum, to a depth of 96 inches, is light yellowish brown loamy sand in the upper part; strong brown loamy sand in the next part; and very pale brown sand in the lower part.

Important properties of the Alaga soil—

Permeability: Rapid
Available water capacity: Low
Organic matter content: Low
Natural fertility: Very low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Lucy, Orangeburg, and Smithdale soils. Lucy soils are in landscape positions similar to those of the Troup soil. They have sandy textures to a depth of 20 to 40 inches. Orangeburg and Smithdale soils are on rounded knolls at slightly higher elevations. They do not have thick sandy surface and subsurface layers. Included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this map unit are wooded. A few areas are used for pasture or hay.

This map unit is poorly suited to most cultivated crops. The main limitations are the low available water capacity, the low fertility, and the hazard of erosion. Conservation tillage, contour farming, and cover crops reduce the runoff rate and help to control erosion. Returning all crop residue to the soil helps to maintain tilth and increases the water-holding capacity. Most crops respond well to applications of lime and frequent, light applications of fertilizer.

These soils are suited to pasture and hay. Coastal bermudagrass and bahiagrass are well suited. The main limitations are the low fertility, the low available water capacity, and the hazard of erosion. The leaching of plant nutrients is a management concern. Frequent, light applications of nitrogen are necessary to maintain the productivity of grasses. Proper stocking rates, pasture rotation, and restricted grazing during prolonged dry periods help to keep the pasture in good condition. Tillage should be on the contour or across the slope.

This map unit is suited to loblolly pine and slash pine. Other species that commonly grow in areas of these soils include longleaf pine and shortleaf pine. On the basis of a 50-year site curve, the mean site index for loblolly pine on these soils is 80. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 1.8 cords per acre per year. The understory vegetation consists mainly of turkey oak, sandjack oak, blackjack oak, bracken fern, common persimmon, poison oak, prickly pear cactus, little bluestem, and panicums.

This map unit has moderate limitations for the management of timber. The main limitations are the restricted use of equipment, the seedling mortality rate, and plant competition. The sandy texture restricts the use of wheeled equipment, especially when the soils are very dry. Harvesting activities should be planned during seasons of the year when the soils are moist. The moderate seedling mortality rate can be compensated for by increasing the number of trees planted. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation. The competing vegetation can be controlled by mechanical methods, herbicides, or prescribed fire.

These soils are suited to most urban uses. They have moderate limitations for building sites and local roads and streets and slight to severe limitations for most kinds of sanitary facilities. The main limitations are the slope and seepage. Cutbanks are unstable and are subject to slumping. Support beams should be used to maintain the stability of the cutbanks. If septic tank absorption fields are used, effluent can surface in downslope areas and create a hazard to health. Increasing the length of the absorption lines and constructing the lines on the contour will help to compensate for this concern. The sandy texture, the low fertility, and the low available water capacity are additional concerns. Applying lime and fertilizer, mulching, and irrigating help to establish lawns and landscape plants.

This map unit has fair potential as habitat for openland wildlife, poor potential as habitat for woodland wildlife, and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey.

The Troup and Alaga soils are in capability subclass VIs. The woodland ordination symbol is 8S.

TsF—Troup-Luverne-Smithdale complex, 15 to 35 percent slopes

This map unit consists of the very deep, somewhat excessively drained Troup soil and the well drained Luverne and Smithdale soils. It is on side slopes and narrow ridges of the highly dissected uplands. The soils occur as areas so intricately intermingled that they could not be mapped separately at the scale selected for mapping. The Troup soil makes up about 35 percent of the unit, the Luverne soil makes up about 30 percent, and the Smithdale soil makes up about 25 percent. Slopes are generally short and complex. They range in length from 35 to 200 feet. Individual areas are irregular in shape. They range from 25 to 1000 acres in size.

The Troup soil is generally on the upper part of slopes. Typically, the surface layer is dark yellowish brown loamy sand about 8 inches thick. The subsurface layer, to a depth of 56 inches, is reddish yellow loamy sand in the upper part and yellowish red loamy sand in the lower part. The subsoil, to depth of 68 inches, is yellowish red sandy loam.

Important properties of the Troup soil—

Permeability: Rapid in the surface layer and subsurface layer; moderate in the subsoil
Available water capacity: Low
Organic matter content: Low
Natural fertility: Very low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

The Luverne soil is generally on the middle and lower parts of slopes. Typically, the surface layer is very dark grayish brown sandy loam about 4 inches thick. The subsoil, to a depth of 45 inches, is red clay in the upper part and red sandy clay loam in the lower part. The substratum, to a depth of 60 inches, is stratified sandy loam and sandy clay loam. Individual strata are yellowish red, red, light gray, and brownish yellow.

Important properties of the Luverne soil—

Permeability: Moderately slow
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Moderate
Flooding: None

The Smithdale soil is generally on the upper and middle parts of slopes and on narrow ridges. Typically, the surface layer is brown sandy loam about 8 inches thick. The subsoil, to a depth of 42 inches, is red sandy clay loam. The substratum, to a depth of 60 inches, is red sandy loam.

Important properties of the Smithdale soil—

Permeability: Moderate in the subsoil; moderately rapid in the substratum
Available water capacity: High
Organic matter content: Low
Natural fertility: Low
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Seasonal high water table: More than 6 feet deep
Shrink-swell potential: Low
Flooding: None

Included in mapping are a few small areas of Bibb, Lucy, and Orangeburg soils. The poorly drained Bibb soils are on narrow flood plains. Lucy soils are in landscape positions similar to those of the Troup soil. They have sandy surface and subsurface layers ranging from 20 to 40 inches thick. Orangeburg soils are on narrow ridgetops. They are similar to the Smithdale soil, but they do not have a significant decrease in clay content within a depth of 60 inches. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres in size.

Most areas of this map unit are used for woodland and as habitat for wildlife. A few areas are used for pasture and hay.

This map unit is not suited to cultivated crops, mainly because the slopes are too steep and the hazard of erosion is too severe. The irregular slope, droughtiness of the Troup soil, and the low fertility are additional limitations.

This map unit is poorly suited to pasture and hay. The main limitations are the slope, the low fertility, the droughtiness of the Troup soil, and the severe hazard of erosion. The more steeply sloping areas are best suited to native grasses. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This map unit is suited to loblolly pine and slash pine. Other species that commonly grow in areas of these soils include shortleaf pine, longleaf pine, sweetgum, and water oak. On the basis of a 50-year site curve, the mean site index for loblolly pine is 80 for the Troup soil, 90 for the Luverne soil, and 85 for the Smithdale soil. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 1.8 cords per acre per year for the Troup soil, 2.2 cords per acre per year for the Luverne soil, and 2.1 cords per acre per year for the Smithdale soil. The understory vegetation consists mainly of greenbrier, poison oak, little bluestem, bracken fern, waxmyrtle, muscadine grape, American beautyberry, red maple, yellow jessamine, huckleberry, and flowering dogwood.

This map unit has moderate limitations for the management of timber. The main limitations are the hazard of erosion, the equipment limitation, the seedling mortality rate, and plant competition. Exposing the surface by removing ground cover increases the hazard of erosion, and exposed soil surfaces are subject to rill and gully erosion. Roads, landings, and skid trails can be protected against erosion by constructing diversions, mulching, and seeding. The slope and sandy texture of the Troup soil restrict the use of equipment. Using standard wheeled and tracked equipment when the soils are wet results in rutting and compaction. Cable yarding systems are safer and damage the soil less. The moderate rate of seedling mortality in areas of the Troup soil is caused by droughtiness. It can be compensated for by increasing the number of trees planted. Plant competition from undesirable plants reduces the growth of trees and can prevent adequate reforestation without intensive site preparation and maintenance. Site preparation controls the initial plant competition, and herbicides can be used to control the subsequent growth.

This map unit is poorly suited to most urban uses. It is generally not suitable as a site for buildings because of the slope. Other limitations include the moderately slow permeability, the moderate shrink-swell potential, and the low strength of the Luverne soil and the sandy texture of the Troup soil.

This map unit has fair potential as habitat for openland wildlife, good potential as habitat for woodland wildlife, and very poor potential as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the establishment of desirable plants. Prescribed burning every three years, rotated among several small tracts of land, can increase the amount of palatable browse for deer and seed-producing plants for quail and turkey. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

The Troup, Luverne, and Smithdale soils are in capability subclass VIIe. The woodland ordination symbol is 9R for the Luverne soil and 8R for the Troup and Smithdale soils.

UdC—Udorthents, gently sloping, smooth

These very deep soils are on uplands in the northeastern and east-central parts of the county. They formed in mixed loamy and clayey material in areas that were strip-mined for brown iron ore and then reclaimed. Most areas have been smoothed to approximate pre-mine contours, but no efforts were made to replace the soil layers and the underlying material as they originally occurred. Little of the original soil material, which consisted mainly of Greenville, Lucedale, Orangeburg, and Smithdale soils, is recognizable in the soil profile because of mixing during reclamation.

Most areas of these soils are rectangular in shape and range from 5 to more than 50 acres in size. Slopes range from 2 to 8 percent and are generally long and smooth, but they may be short and complex. These soils are highly variable within short distances. They may be clayey, loamy, or stratified with various textures. The content of ironstone fragments is also highly variable, and fragments range in size from gravel to boulders.

Included in mapping are a few small areas of unaltered soils, mostly Greenville, Lucedale, Orangeburg, and Smithdale soils. They are generally on the edges of delineations. Included soils make up less than 10 percent of the map unit, and individual areas are generally less than 3 acres in size.

Most areas of this map unit are used for pasture or are idle. A few areas are used as woodland, and a few areas are used for cultivated crops.

This map unit is generally poorly suited to most agricultural and urban uses. Limitations for plant growth include poor tilth, low fertility, low organic matter content, and droughtiness. Limitations for most urban uses include slow permeability, a high content of rock fragments, and variable soil textures. Onsite investigation and testing are needed to determine the suitability of this unit for any use.

This map unit is suited to loblolly pine and slash pine. On the basis of a 50-year site curve, the mean site index for loblolly pine is 70. The average annual growth of well stocked, even-aged, unmanaged stands of loblolly pine at 25 years of age is 1.4 cords per acre per year. The understory vegetation consists mainly of panicums, little bluestem, sumac, American beautyberry, greenbrier, sweetgum, common persimmon, and water oak.

These soils have moderate limitations for the management of timber. The main limitation is the moderate rate of seedling mortality caused by soil compaction and droughtiness. It can be compensated for by increasing the number of trees planted. Planting trees on raised beds or subsoiling to loosen the compacted soil material will help to increase survival of seedlings.

Udorthents, gently sloping, smooth, are in capability subclass IVe. The woodland ordination symbol is 7D.

UdF—Udorthents, hilly, rough

These very deep soils are on uplands in the northeastern and east-central parts of the county. They formed in mixed loamy and clayey material in areas that were strip-mined for brown iron ore and were not reclaimed. Most areas consist of a series of long, narrow, parallel ridges or piles of loamy and clayey material that has a high content of ironstone fragments. Little of the original soil material, which consisted mostly of Greenville, Lucedale, Orangeburg, and Smithdale soils, is recognizable in the soil profile because of mixing during mining activities.

Most areas of these soils are rectangular in shape and range from 10 to more than 100 acres in size. Slopes range from 8 to 35 percent. Deep gullies are common throughout most areas. These soils are highly variable within a short distance. They may be clayey, loamy, or stratified with various textures. The content of ironstone fragments is also highly variable and fragments range in size from gravel to boulders.

Included in mapping are a few small areas of unaltered soils, mostly Greenville, Lucedale, Orangeburg, and Smithdale soils. They are generally on the edges of delineations. Included soils make up about 10 percent of the map unit, but individual areas are generally less than 3 acres in size.

Most areas of this map unit are idle and have reverted to poor quality woodland. Loblolly pine, shortleaf pine, longleaf pine, sweetgum, and yellow poplar are common trees.

This map unit is generally poorly suited to most agricultural and urban uses and is poorly suited to woodland. The steep, irregular landscape and extreme variability of the soils are limitations for most uses. Additional limitations include poor tilth, low fertility, low organic matter content, droughtiness, and a high content of rock fragments. Onsite investigation and testing are needed to determine the suitability of this unit for any use.

Udorthents, hilly, rough, are in capability subclass VIIe. The woodland ordination symbol is 6R.

Prime Farmland

In this section, prime farmland is defined, and the soils in Butler County that are considered prime farmland are listed. Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 8 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 143,600 acres, or about 29 percent of the total area, in Butler County meet the soil requirements for prime farmland. The prime farmland is scattered throughout the county. About 38,500 acres is used for cultivated crops. The main crops are cotton, corn, soybeans and peanuts.

Because Butler County is primarily rural and does not have a large population center, few areas of prime farmland have been converted to industrial or urban uses, except in the vicinity of Greenville.

The map units in the survey area that are considered prime farmland are listed at the end of this section. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 5. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

The map units that meet the requirements for prime farmland in Butler County are:

BeB Benndale sandy loam, 1 to 5 percent slopes
CaA Cahaba fine sandy loam, 0 to 2 percent slopes, rarely flooded
EuA Eunola sandy loam, 0 to 2 percent slopes, rarely flooded
GrB Greenville sandy loam, 1 to 3 percent slopes
HaB Halso silt loam, 1 to 3 percent slopes
LfB Lucedale sandy loam, 1 to 3 percent slopes
LuB Luverne sandy loam, 1 to 5 percent slopes
LyA Lynchburg sandy loam, 0 to 2 percent slopes
MaB Macon fine sandy loam, 1 to 5 percent slopes
MbB Malbis fine sandy loam, 1 to 3 percent slopes
MbC Malbis fine sandy loam, 5 to 8 percent slopes
OrB Orangeburg sandy loam, 1 to 5 percent slopes
OrC Orangeburg sandy loam, 5 to 8 percent slopes

Use and Management of the Soils

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

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

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational 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

Kenneth M. Rogers, conservation agronomist, Natural Resources Conservation Service, helped to prepare this section.

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed for each soil, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading “Detailed Soil Map Units.” Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension System.

In 1982, approximately 52,000 acres of cropland and 46,000 acres of pasture were in Butler County *(1, 2)*. Approximately 1,600 acres of peanuts, 6,000 acres of corn, 9,000 acres of soybeans, 3,500 acres of grain sorghum, and 5,500 acres of wheat were planted in Butler County in 1984. Also, 7,000 acres of hay and 350,000 pounds of pecans were harvested *(1, 2)*. A small acreage of tobacco is grown in the southern part of the county (fig. 12). The total acreage used for cultivated crops and pasture has been decreasing slightly for several years. The current trend is toward the conversion of marginal cropland throughout the county.

The potential in Butler County for the increased production of food and fiber is good. About 30,000 acres of land that is currently used for pasture and woodland is potentially good cropland *(19)*. The yields can be increased in cultivated areas if the most current technology is applied. This soil survey can help land users make sound land management decisions and facilitate the application of crop production technology.

The field crops that are suited to the soils and climate in Butler County include many crops that are not commonly grown because of economic considerations. Peanuts, corn, and soybeans are the main row crops. Grain sorghum, cotton, vegetable crops, and similar crops can be grown if economic conditions are favorable. Wheat, rye, and oats are the only close-growing crops currently planted for grain production, although barley and triticale can be grown. The specialty crops grown in the county include peas, okra, melons, tobacco, sod, and alfalfa. Many of the soils in the survey area, including Benndale, Cahaba, Greenville, Lucy, Macon, Malbis, and Orangeburg soils, are well suited to specialty crops. If economic conditions are favorable, a large acreage of these crops can be grown. Pecans are the only orchard crop that is grown commercially in the county. Additional

Figure 12.—Specialty crops, such as tobacco, are well suited to areas of Benndale sandy loam, 1 to 5 percent slopes.

information regarding specialty crops can be obtained from the local office of the Cooperative Extension System or the Natural Resources Conservation Service.

Soil erosion is a major management concern on about one-half of the cropland and pasture in Butler County *(19)*. If the slope is more than 2 percent, erosion is a potential hazard. Benndale, Greenville, Lucedale, Malbis, and Orangeburg soils are some of the sloping soils that are presently cultivated and that are subject to erosion.

Soil erosion can reduce productivity and can result in the pollution of streams. Productivity is reduced as the surface layer of the soil erodes and more of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils that have a clayey subsoil, such as Greenville, Halso, and Luverne soils, and on soils that have a plinthic layer in the subsoil that restricts rooting depth, such as Malbis soils. Controlling erosion on farmland minimizes the pollution of streams and improves the quality of water for municipal uses, for recreational uses, and for fish and wildlife.

Erosion-control practices provide a protective plant cover, increase the rate of water infiltration, and help to control runoff. A cropping system that keeps plant cover and crop residue on the surface for extended periods can hold soil losses to amounts that will not reduce the productive capacity of the soils. Including grasses and legumes in the cropping system helps to control erosion in sloping areas and improves tilth for the crops that follow in the rotation. The legumes also increase the nitrogen levels in the soils.

Applying a system of conservation tillage and leaving crop residue on the surface increase the rate of water infiltration and help to control runoff and erosion. Using a no-till method of planting reduces the hazard of erosion in sloping areas, and this practice is suitable on most of the soils in the county.

Terraces and diversions help to control runoff and erosion. They are most practical on very deep, well drained soils that have uniform slopes, such as Greenville, Malbis, and Orangeburg soils. Sandy soils, such as Alaga, Bonneau, Lucy, and Troup soils are not suitable for terracing because gullies form easily when water is concentrated on the surface. Grassed waterways or underground tile outlets are essential in areas where terraces and diversions are installed. Diversions can be used to intercept surface runoff from hilly uplands and to divert the water around the fields to vegetated disposal areas.

Contour farming is a very effective erosion-control method in cultivated areas when it is used in conjunction with a water-disposal system. It is best suited to soils that have smooth, uniform slopes, such as Greenville, Lucedale, Malbis, and Orangeburg soils.

Soil blowing can be a management concern in early spring on some upland soils, especially if the soils are dry and are not protected by a plant cover. The hazard of erosion is generally highest after the seedbed has been prepared, after planting, and when the plants are small. Tillage methods that leave crop residue on the surface reduce the hazard of soil blowing. Conventional planting practices should include an implement that scratches the surface, leaving a rough, irregular pattern. Also, strips of close-growing crops are effective as windbreaks. If possible, seedbed preparation should be delayed until after March, which is generally windy. Additional information about the design of erosion-control practices is available at the local office of the Natural Resources Conservation Service.

Butler County has an adequate amount of rainfall for the crops commonly grown. Prolonged periods of drought are rare, but the distribution of rainfall during spring and summer generally results in droughty periods during the growing season in most years. Irrigation may be needed during these periods to reduce plant stress. Most of the soils that are commonly used for cultivated crops are suitable for irrigation; however, the amount of water applied should be regulated to prevent excessive runoff. Some soils, such as Greenville, Halso, and Luverne soils, have a slow infiltration rate that limits their suitability for irrigation.

Most of the soils used for crops in Butler County have a surface layer of sandy loam, which is light in color and has a low content of organic matter. Regular additions of crop residue, manure, and other organic material can improve the soil structure and reduce crust formation, thus increasing the water infiltration rate.

The use of heavy equipment during tillage may result in the formation of a compacted layer below the surface. This compacted layer is commonly referred to as a plow pan or a traffic pan. It commonly forms about 2 to 8 inches below the soil surface, and it may restrict the infiltration of water and the growth of plant roots. The soils that are most susceptible to the formation of traffic pans include Benndale, Cahaba, Eunola, Greenville, Lucedale, Malbis, and Orangeburg soils.

Natural fertility is low in most of the soils in Butler County. Most of the soils are acid throughout the profile. All of the soils, except Demopolis, Leeper, and Sumter soils, require applications of agricultural limestone to neutralize soil acidity. The crops grown in the county respond well to applications of lime and fertilizer. The levels of available phosphorus and potash are generally low in most of the soils; however, some fields may have a buildup of phosphorus or potassium because of past applications of commercial fertilizer. Therefore, all applications of lime and fertilizer should be based on the results of a soil test. Leaching is a concern in areas of sandy soils such as Alaga, Bigbee, Bonneau, Lucy, and Troup soils. Higher levels of nitrogen, applied in split applications, should be used on these soils. The Cooperative Extension System can help in determining the kinds and amounts of fertilizer and lime to apply.

Soil wetness is a management concern in areas of Bethera, Bibb, Lynchburg, Mantachie, Rains, and Leeper soils. A drainage system is needed to minimize the harmful effects of excess water in areas of these soils. Flooding during the growing season is also a concern on most of these soils. Planting dates may be delayed and crops may be damaged in some years because of the flooding.

Bahiagrass and coastal bermudagrass are the main perennial grasses grown for pasture and hay in Butler County. Rye, ryegrass, oats, and wheat are grown as annual cool-season grass forage. Millet, sorghum, and hybrid forage sorghums provide most of the annual warm-season grass forage. These annuals are generally grown in areas of cropland for temporary grazing or for hay. Arrowleaf clover, crimson clover, ball clover, and other cool-season legumes are suited to most of the soils in the county, especially if agricultural limestone is applied in proper amounts. Alfalfa, a warm-season perennial legume, is well suited to well drained soils, such as Greenville, Lucedale, Malbis, and Orangeburg soils.

Several management practices are needed on all of the soils that are used for pasture and hay production. These practices include proper stocking rates, control of weeds, proper fertilization, rotation grazing, and scattering of animal droppings. Overgrazing, low rates of fertilization, and acid soils are the main concerns for pasture management. They can result in weak plants and poor stands that are quickly infested with weeds. Maintaining a good, dense cover that has the desired pasture species will prevent weeds from becoming established.

Yields per Acre

The average yields per acre that can be expected of the principal crops and pasture plants under a high level of management are shown in tables 6 and 7. 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 land capability classification of each map unit also is shown in the table.

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, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

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 the table 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 Natural Resources Conservation Service or of the Cooperative Extension System can provide information about the management and productivity of the soils for those crops.

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 criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include 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.

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

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

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

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

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

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 and IIIe-6.

The capability classification of each map unit is given in the section “Detailed Soil Map Units” and in the yields table.

Landscaping and Gardening

Kenneth M. Rogers, conservation agronomist, Natural Resources Conservation Service, helped prepare this section.

The land in residential areas is used primarily as homesites and for driveways and streets. Remaining areas of each lot are commonly used for lawns, which enhance the appearance of the home; as gardens for vegetables or flowers and shrubs; as orchards for fruits and nuts; for recreational uses; as habitat for animals and birds; for trees, which provide shade and promote energy conservation; for vegetation and structures designed to abate noise, enhance privacy, and provide protection from the wind; and for septic tank absorption fields. Because the outdoor areas are used for several purposes, careful planning and a good understanding of the soils are important.

This section contains general soil-related information for landscaping and gardening. Other information, especially that which is not directly related to the soils, may be obtained from the local office of the Cooperative Extension System, the Natural Resources Conservation Service, and private businesses that provide landscaping and related services. The amount of soil information needed for some areas is beyond the scope of this survey and is more detailed than the map scale used. For this reason, onsite investigation is recommended.

Most of the soils in the residential areas of Butler County have been disturbed to some degree during construction of houses, streets, driveways, and utility services. This construction involved cutting and filling, grading, and excavating. As a result, soil properties are more variable and less predictable than they are in undisturbed areas. Onsite examination is necessary in planning land uses for soils in disturbed areas.

Some of the poorest soils for plant growth are Arundel, Oktibbeha, Halso, and Luverne soils that had the surface layer removed during grading. The exposed, dense, firm subsoil restricts root penetration, absorbs little rainfall, and results in excessive runoff. Incorporating organic matter into the soil improves tilth, increases the rate of water infiltration, and provides a more desirable rooting medium. Areas that are subject to intensive foot traffic should be covered with gravel or a mulch, such as pine bark or wood chips.

Some soils, such as Bethera, Bibb, and Rains soils, are wet. The wetness limits the selection of plants to those that are tolerant of a high moisture content in the soil. Several methods can be used to minimize the effects of soil wetness. Installing underground tile drains can lower the water table in permeable soils. Bedding the surface layer of slowly permeable soils, such as Bethera soils, helps to provide a satisfactory root zone for some plants.

Some soils, such as Bibb, Congaree, Iuka, Mantachie, and Leeper soils, are on flood plains. Most plants used for gardening and landscaping can be grown on these soils, but consideration should be given to the effects of floodwater. Surface drainage is a management concern because urban uses often result in increased surface runoff rates, which increase the frequency and severity of flooding. Advice and assistance in solving drainage problems can be obtained from the Natural Resources Conservation Service, municipal and county engineering departments, and private engineering companies.

Sandy soils, such as Alaga, Bigbee, Bonneau, Lucy, and Troup soils, are droughty, have low fertility, and have a low content of organic matter. Droughtiness limits the selection of plants that will grow unless irrigation is provided. Additions of organic matter increase the water-holding capacity and help to retain nutrients in the rooting zone. Supplemental watering and split applications of plant nutrients are recommended. Using a mulch, such as pine bark, wood chips, or pine straw, or incorporating peat moss or well-decomposed manure into the soil provides a more desirable medium for plant growth.

Natural fertility is low in most of the soils in Butler County. Most of the soils, with the exception of Demopolis, Leeper, and Sumter soils, are strongly acid or very strongly acid. Additions of ground limestone are needed to neutralize the acidity of most of the soils. The original surface layer contains the most plant nutrients and has the most favorable pH for most plants. In many areas, fertility of the surface layer has been improved by applications of lime and fertilizer. If the surface layer is removed during construction, the remaining soil is very acid and is low in available plant nutrients. Also, some nutrients are unavailable for plant growth in acid soil conditions. Disturbed soils generally need large amounts of lime and fertilizer, which should be applied according to the results of soil tests and the type of plants grown. Information on sampling for soil testing can be obtained from the Cooperative Extension System, the Natural Resources Conservation Service, and local nurseries.

In the following paragraphs, some of the plants that are used in landscaping and gardening and some management relationships between the plants and the soils are described. Information in this section should be supplemented by consultations with specialists in the Cooperative Extension System, the Natural Resources Conservation Service, and private landscaping and gardening businesses.

The grasses used for landscaping in Butler County are mainly vegetatively propagated species, such as zoysiagrass, hybrid bermudagrass, St. Augustinegrass, centipedegrass, and seeded species, such as common bermudagrass and centipedegrass. The grasses commonly used for short-term cover include ryegrass, rye, wheat, sudangrass, and millet.

The vegetatively propagated plants are usually planted as sprigs, plugs, or sod. Additions of topsoil may be needed before planting in some areas. Also, lime and fertilizer should be applied and incorporated into the soil. The plants should be placed in close contact with the soil, and the plantings should be watered to ensure the establishment of the root system. St. Augustinegrass, centipedegrass, and certain strains of zoysiagrass are moderately shade tolerant. St. Augustinegrass and zoysiagrass normally require more maintenance than centipedegrass. The strains of hybrid bermudagrass are fast growing, but they are not as tolerant of shade as St. Augustinegrass, centipedegrass, or zoysiagrass.

Common perennial grasses that are established by seeding include common bermudagrass and centipedegrass. Lime and fertilizer should be applied and incorporated into the soil before seeding. Proper planting depth is important when grasses are established from seed.

Short-term vegetative cover is used to protect the soil at construction sites or to provide cover between the planting seasons of the desired grass species. The most commonly used grasses for short-term cover are ryegrass for cool seasons and sudangrass or millet for warm seasons. These species are annuals and die after the growing season.

Periodic applications of lime and fertilizer are needed on all types of grasses. The kinds and amounts of lime and fertilizer to apply should be based on the results of soil tests.

Vines can be used to provide vegetative cover in moderately shaded areas and on steep slopes that cannot be mowed. English ivy and periwinkle can be used for ground cover. These plants also can be used on walls and fences. All of these plants are propagated vegetatively, usually from potted plants or sprigs.

Mulches can be used for ground cover in areas where traffic is too heavy for grass cover, in areas where shrubs and flowers are desired with additional ground cover, and in densely shaded areas. Mulches provide effective ground cover. They also provide immediate cover for erosion control in areas where no live vegetation is desired. Effective mulches include pine straw, small-grain straw, hay, composted grass clippings, wood chips, pine bark, gravel, and several manufactured materials. The type of mulch to use depends to some extent on the hazard of erosion. Mulches also can be used to conserve soil moisture and control weeds around trees, shrubs, and flowers.

Shrubs are used primarily to enhance the appearance of homesites. They also can be used to control traffic. They can be effective in dissipating the energy from raindrops and from runoff from roofs of houses. Most native and adapted species add variety to residential settings. Reaction to acidity and fertility levels vary greatly among shrub types.

Vegetable and flower gardens are important to many individuals and businesses. However, the soils in areas where homes and businesses are established may not be suited to vegetables and flowers. Soils that have been disturbed by construction may not be productive unless topsoil is applied. Soils that have slopes of more than 8 percent have poor potential for vegetable gardening because of the hazard of erosion if the soils are tilled. Generally, soils on steep slopes have a thin surface layer. Flower gardening is possible on steep slopes, however, if mulches are used to help control erosion.

Gardens in which composted tree leaves and grass clippings have been incorporated into the soil generally are fertile and friable and have good moisture content. Additional information on vegetables is included under the heading “Crops and Pasture”.

Most garden plants grow best in soils that have a pH level between 5.5 and 6.5. The fertility level should be high. Many gardeners apply too much fertilizer or have used fertilizers with the wrong combination of plant nutrients. Soil testing is the only effective way to determine how much and what type of fertilizer to apply. Soil testing information can be obtained from the local office of the Cooperative Extension System, the Natural Resources Conservation Service, or from retail fertilizer businesses.

Trees are important in homesite landscaping. Information on relationships between soils and trees is available in the section “Woodland Management and Productivity.” Special assistance in urban forestry can be obtained from the Alabama Forestry Commission.

Woodland Management and Productivity

Jerry L. Johnson, forester, Natural Resources Conservation Service, helped to prepare this section.

Commercial forest land makes up about 392,000 acres, or about 80 percent of the total land area in Butler County. The forested acreage increased about 7 percent from 1972 to 1982, primarily because of the conversion of cropland and pasture to forest land. Private landowners own 51 percent of the forest land in the county. The forest industry owns the remaining 49 percent of the forest land *(20)*.

The forest types in Butler County include 11,700 acres of longleaf-slash pine, 181,300 acres of loblolly-shortleaf pine, 64,400 acres of oak-pine, 105,300 acres of oak-hickory, 17,600 acres of oak-gum-cypress, 5,900 acres of elm-ash-cottonwood, and 5,900 acres of unclassified forest land *(20)*.

Most of the soils in the county are well suited to loblolly pine and slash pine and have a site index of 80 or above. A few soils, such as Demopolis, Leeper, Sumter, and Watsonia soils, in the northwest corner of the county are generally unsuited to the commercial production of pine trees.

Table 8 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 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 an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce in a pure stand under natural conditions. The number 1 indicates low potential productivity; 2 or 3, moderate; 4 or 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *W*, excess water in or on the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; and *S*, sandy texture. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, W, D, C, and S.

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

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. 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. The estimates of the productivity of the soils in this survey are based on published data *(5, 6, 7, 8, 9, 10, 19)*.

The *volume*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cords per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Recreation

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 scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. 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 recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In the table, 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 a combination of these measures.

The information in the table 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 and horseback riding 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.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Robert E. Waters, biologist, Natural Resources Conservation Service, helped to prepare this section.

Because of its geographic location, climate, land use patterns, and other characteristics, Butler County supports a variety and abundance of game animals, nongame animals, and furbearers. Common game species include bobwhite quail, cottontail rabbit, various species of ducks and geese, gray squirrel, mourning dove, whitetailed deer, and wild turkey. Common nongame species include armadillos, blackbirds, bluebirds, bluejays, cardinals, crows, egrets, herons, meadowlarks, mockingbirds, sparrows, thrushes, vireos, warblers, woodpeckers, and snakes. Common furbearers include beaver, bobcat, coyotes, fox, mink, muskrat, otter, and raccoon.

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 parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The 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 established, 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 established, 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 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 herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, soybeans, grain sorghum, wheat, oats, and rye.

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

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, dewberry, and partridge pea.

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

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

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, wildrice, cattail, rushes, sedges, and reeds.

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

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

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, mourning dove, meadowlark, field sparrow, cottontail rabbit, 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, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, otter, and beaver.

Engineering

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. Ratings are given for 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 should 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 or 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 kinds 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 evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and 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, local roads and streets, and lawns and landscaping. 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 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, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 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, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and 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.

The table also shows the suitability of the soils for use as daily cover for landfill. 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 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 filter the effluent effectively. 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.

The table 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 resulting from rapid permeability in 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 should be considered.

The ratings in the table 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 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 sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

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

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock or the water table to permit revegetation. The soil material used as the 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 to 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, a 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 a 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 are wet and have a water table at a depth of 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. They are used in many kinds of construction. Specifications for each use vary widely. In the table, 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 high 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 and for embankments, dikes, and levees. 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, irrigation, 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.

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 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 the potential for 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, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control 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 erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect 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 and 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 to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, 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 the heading “Soil Series and Their Morphology.”

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. “Loam,” for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, “gravelly.” Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(4)* and the system adopted by the American Association of State Highway and Transportation Officials *(3)*.

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, CL-ML.

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.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 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 ovendry 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 generally 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, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving 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 and septic tank absorption fields.

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 and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

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

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 classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, more than 6 percent; and *very high*, greater than 9 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. Other factors being equal, 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 the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in 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 based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, 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 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 is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

The table 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, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of flooding is more than 50 percent in any year). *Common* is used when the occasional and frequent classes are grouped for certain purposes. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

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 little or no horizon development.

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

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on observations of the water table at selected sites and on the evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in the table are the depth to the seasonal high water table; the kind of water table—that is, perched 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 the table.

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.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

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 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 results in a severe hazard of corrosion. 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

The results of physical analysis of several typical pedons in the survey area are given in table 18 and the results of chemical analysis in table 19. The data are for soils sampled at carefully selected sites. Unless otherwise indicated, the pedons are typical of the series. They are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the Agronomy and Soils Mineralogy Laboratory, Auburn University, Auburn, Alabama.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an ovendry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods *(11, 21)*.

Sand—(0.05-2.0 mm fraction) weight percentages of material less than 2 mm (3A1).

Silt—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all material less than 2 mm (3A1).

Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of material less than 2 mm (3A1).

Extractable bases—method of Hajek, Adams, and Cope *(11)*.

Extractable acidity—method of Hajek, Adams, and Cope *(11)*.

Cation-exchange capacity—ammonium acetate, pH 7.0, steam distillation (5A8b).

Cation-exchange capacity—sum of cations (5A3a).

Base saturation—method of Hajek, Adams, and Cope *(11)*.

Reaction (pH)—1:1 water dilution (8C1a).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(17, 23)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven 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 Ultisol.

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 Udult (*Ud*, meaning humid, plus *ult*, from Ultisol).

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; type of saturation; 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 Hapludults (*Hapl*, meaning minimal horizonation, plus *udults*, the suborder of the Ultisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup 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 taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, siliceous, thermic Typic Hapludults.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The Cahaba series is an example of fine-loamy, siliceous, thermic Typic Hapludults.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” *(22)*. Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” *(17)* and in “Keys to Soil Taxonomy” *(23)*. Unless otherwise indicated, 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.”

Alaga Series

The Alaga series consists of very deep, somewhat excessively drained soils on ridgetops and side slopes of the uplands. These soils formed in thick layers of sandy sediments. Slopes range from 0 to 15 percent.

Soils of the Alaga series are thermic, coated, Typic Quartzipsamments.

Alaga soils are commonly associated on the landscape with Lucy, Smithdale, and Troup soils. Lucy soils are in slightly higher landscape positions than the Alaga soils. They have a loamy argillic horizon within a depth of 20 to 40 inches. Smithdale soils are in lower positions than the

Alaga soils. They do not have a thick sandy epipedon. Troup soils are in landscape positions similar to those of the Alaga soils. They have a loamy argillic horizon within a depth of 40 to 80 inches.

Typical pedon of Alaga loamy sand, in an area of Alaga-Troup complex, 0 to 5 percent slopes; about 2.5 miles west of Forest Home, 450 feet east and 1,650 feet north of the southwest corner of sec. 5, T. 10 N., R. 12 E.

Ap—0 to 6 inches; dark brown (10YR 3/3) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.
C1—6 to 48 inches; strong brown (7.5YR 5/6) loamy sand; single grained; loose; common fine roots; strongly acid; gradual wavy boundary.
C2—48 to 96 inches; strong brown (7.5YR 5/6) sand; single grained; loose; few fine roots; few streaks of pale brown (10YR 6/3) sand; very strongly acid; gradual wavy boundary.
C3—96 to 114 inches; strong brown (7.5YR 5/8) loamy sand; single grained; loose; very strongly acid.

The thickness of the sandy horizons is more than 80 inches. Reaction ranges from extremely acid to moderately acid throughout the profile, except in areas where lime has been added.

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

The C horizon has hue of 7.5YR or 10YR, value of 4 to 8, and chroma of 3 to 8. Texture is loamy sand, loamy fine sand, or sand.

Arundel Series

The Arundel series consists of moderately deep, well drained soils on ridgetops and side slopes of the uplands (fig. 13). These soils formed in marine sediments consisting of acid clay that are underlain by level-bedded siltstone or claystone (buhrstone). Slopes range from 5 to 35 percent.

Soils of the Arundel series are clayey, montmorillonitic, thermic Typic Hapludults.

Arundel series are commonly associated on the landscape with Halso and Luverne soils. Halso soils are in landscape positions similar to those of the Arundel soils. They do not have bedrock within a depth of 40 inches. Luverne soils are in higher landscape positions than the Arundel soils. They do not have bedrock within a depth of 60 inches.

Typical pedon of Arundel fine sandy loam, 8 to 35 percent slopes, about 12 miles northwest of Georgiana, 1,800 feet west and 180 feet south of the northeast corner of sec. 6, T. 9 N., R. 12 E.

A—0 to 6 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; common fine roots; extremely acid; clear smooth boundary.
Bt1—6 to 10 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; common fine roots; common fine black concretions of manganese oxide; few faint clay films on faces of some peds; extremely acid; clear smooth boundary.
Bt2—10 to 18 inches; strong brown (7.5YR 5/6) clay; strong medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; extremely acid; clear smooth boundary.
Bt3—18 to 24 inches; dark yellowish brown (10YR 4/4) clay; moderate medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; about 5 percent fragments of claystone; extremely acid; abrupt wavy boundary.
Cr—24 to 60 inches; weathered bedrock; massive; level-bedded; can be cut with difficulty with hand tools.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. Reaction ranges from extremely acid to strongly acid throughout, except for the surface layer in areas where lime has been added.

The A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 to 3.

The Bt horizon has hue of 2.5YR to 10YR, value of 4 or 5, and chroma of 4 to 6. Texture is clay or clay loam.

The Cr horizon is level-bedded siltstone or claystone (buhrstone). It is rippable by light machinery and can be cut with hand tools in fresh exposures.

Benndale Series

The Benndale series consists of very deep, well drained soils on broad ridgetops of the uplands. These soils formed in loamy sediments. Slopes range from 1 to 5 percent.

Soils of the Benndale series are coarse-loamy, siliceous, thermic Typic Paleudults.

Benndale soils are commonly associated on the landscape with Bonneau and Malbis soils. Bonneau soils are in landscape positions similar to those of the Benndale soils. They have a thick sandy epipedon. Malbis soils are in similar landscape positions at slightly higher elevations. They are fine-loamy.

Typical pedon of Benndale sandy loam, 1 to 5 percent slopes, about 0.5 miles east of Industry, 200 feet west and 900 feet south of the northeast corner of sec. 1, T. 7 N., R. 14 E.

Ap—0 to 12 inches; dark brown (10YR 4/3) sandy loam; weak fine granular structure; very friable;

slightly acid; abrupt smooth boundary.

Bt1—12 to 22 inches; yellowish brown (10YR 5/4) sandy loam; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay; few fine streaks of uncoated sand; very strongly acid; gradual wavy boundary.

Bt2—22 to 42 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay; few fine streaks of uncoated sand; very strongly acid; gradual wavy boundary.

Bt3—42 to 60 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

Bt4—60 to 66 inches; brownish yellow (10YR 6/6) sandy loam; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is very strongly acid or strongly acid throughout the profile, except for the surface layer in areas where lime has been added.

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

The E horizon, if it occurs, has hue of 10YR, value of 4 or 5, and chroma of 4 to 6. Texture is fine sandy loam or sandy loam.

The upper part of the Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. Texture is loam, fine sandy loam, or sandy loam.

The lower part of the Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 to 8. Texture is fine sandy loam, sandy loam, or sandy clay loam.

Bethera Series

The Bethera series consists of very deep, poorly drained soils on low stream terraces. These soils formed in clayey sediments. Bethera soils are subject to occasional flooding. Slopes range from 0 to 1 percent.

Soils of the Bethera series are clayey, mixed, thermic Typic Paleaquults.

Bethera soils are commonly associated on the landscape with Bibb, Cahaba, Eunola, Lynchburg, Mantachie, and Rains soils. The Bibb soils and the somewhat poorly drained Mantachie soils are in lower positions on flood plains. They are loamy throughout the profile. The well drained Cahaba soils, the moderately well drained Eunola soils, and the somewhat poorly drained Lynchburg soils are on higher terraces. They are fine-loamy. Rains soils are in landscape positions similar to those of the Bethera soils. They are fine-loamy.

Typical pedon of Bethera fine sandy loam, in an area of Rains-Bethera complex, 0 to 1 percent slopes, occasionally flooded; about 1.5 miles east of Georgiana, 3,200 feet north and 100 feet east of the southeast corner of sec. 25, T. 8 N., R. 13 E.

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

BEg—6 to 12 inches; grayish brown (10YR 5/2) clay loam; weak medium subangular blocky structure; friable; few fine roots; common medium faint gray (10YR 6/1) iron depletions; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation; very strongly acid; clear wavy boundary.

Btg1—12 to 20 inches; grayish brown (10YR 5/2) clay; moderate medium subangular blocky structure; firm; many fine roots; few faint clay films on faces of some peds; many medium distinct brownish yellow (10YR 6/6) masses of iron accumulation; extremely acid; gradual wavy boundary.

Btg2—20 to 36 inches; gray (10YR 5/1) clay; moderate medium subangular blocky structure; firm; few fine roots; few faint clay films on faces of some peds; common medium prominent red (2.5YR 4/6) masses of iron accumulation; extremely acid; gradual wavy boundary.

Btg3—36 to 46 inches; gray (10YR 6/1) clay; moderate medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of most peds; common medium prominent red (2.5YR 4/6) and many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation; extremely acid; gradual wavy boundary.

Btg4—46 to 56 inches; gray (10YR 5/1) clay; weak coarse subangular blocky structure; firm; common distinct clay films on faces of most peds; many medium distinct yellowish brown (10YR 5/6) and few fine prominent yellowish red (5YR 4/6) masses of iron accumulation; extremely acid; gradual wavy boundary.

Btg5—56 to 72 inches; grayish brown (2.5Y 5/2) clay; weak coarse subangular blocky structure; firm; few faint clay films on faces of peds; many medium distinct yellowish brown (10YR 5/6) and few medium prominent yellowish red (5YR 5/6) and red (2.5YR 4/6) masses of iron accumulation; extremely acid.

The thickness of the solum is more than 60 inches. Reaction ranges from extremely acid to moderately acid throughout the profile, except for the surface layer in areas where lime has been added.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The BEg horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. Texture is clay loam or sandy clay loam.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It has common to many iron accumulations in shades of red, yellow, and brown. Texture is clay, clay loam, or sandy clay.

Bibb Series

The Bibb series consists of very deep, poorly drained soils in low positions on flood plains. These soils formed in loamy and sandy alluvium. Bibb soils are subject to frequent flooding for brief periods several times each year. Slopes range from 0 to 1 percent.

Soils of the Bibb series are coarse-loamy, siliceous, acid, thermic Typic Fluvaquents.

Bibb soils are commonly associated on the landscape with Bigbee, Cahaba, Eunola, Iuka, and Mantachie soils. The excessively drained Bigbee soils, the well drained Cahaba soils, and the moderately well drained Eunola soils are on adjacent stream terraces. The moderately well drained Iuka soils and the somewhat poorly drained Mantachie soils are in slightly higher, more convex positions on the stream flood plain.

Typical pedon of Bibb loam, in an area of Mantachie, Bibb, and Iuka soils, 0 to 1 percent slopes, frequently flooded; about 2.5 miles southeast of Georgiana, 1,320 feet east and 600 feet north of the southwest corner of sec. 31, T. 8 N., R. 14 E.

A—0 to 7 inches; dark gray (10YR 4/1) loam; moderate fine granular structure; very friable; many fine and medium roots; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in root channels; very strongly acid; clear smooth boundary.

Ag—7 to 16 inches; very dark gray (10YR 3/1) loam; weak fine granular structure; very friable; common fine roots; common thin strata of light gray (10YR 7/2) sand; common fine faint gray (10YR 5/1) iron depletions; very strongly acid; clear wavy boundary.

Cg1—16 to 22 inches; dark gray (10YR 4/1) sandy loam; massive; very friable; few fine roots; common thin strata of light gray (10YR 7/2) sand; very strongly acid; clear wavy boundary.

Cg2—22 to 30 inches; light gray (10YR 7/1) sandy loam; massive; very friable; few fine roots; very strongly acid; clear wavy boundary.

Cg3—30 to 60 inches; gray (10YR 6/1) sandy loam; massive; friable; few thin strata of loamy fine sand and sandy clay loam; common medium distinct brownish yellow (10YR 6/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Reaction ranges from extremely acid to strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3.

The Ag horizon has hue of 10YR or 2.5Y, value of 3 to 7, and chroma of 1 or 2. Texture is sandy loam, fine sandy loam, or loam.

The Cg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. Some pedons have few to many iron accumulations in shades of red, yellow, or brown. Texture commonly is loam, silt loam, or sandy loam. Some pedons have textures of sand, loamy sand, or loamy fine sand in the lower part.

Bigbee Series

The Bigbee series consists of very deep, excessively drained soils on low stream terraces. These soils formed in sandy sediments. Bigbee soils are rarely flooded, but they may be flooded during periods of unusually heavy and prolonged rainfall. Slopes range from 0 to 3 percent.

Soils of the Bigbee series are thermic, coated, Typic Quartzipsamments.

Bigbee soils are commonly associated on the landscape with Bibb, Bethera, Cahaba, Eunola, Iuka, and Mantachie soils. The poorly drained Bibb soils, the moderately well drained Iuka soils, and the somewhat poorly drained Mantachie soils are on lower parts of stream flood plains. The poorly drained Bethera soils are on lower terraces. They have a clayey, argillic horizon. The well drained Cahaba and moderately well drained Eunola soils are in landscape positions similar to those of the Bigbee soils. They are fine-loamy.

Typical pedon of Bigbee loamy sand, 0 to 3 percent slopes, rarely flooded, about 9 miles east of Greenville, 2,200 feet west and 300 feet north of the southeast corner of sec. 6, T. 9 N., R. 16 E.

Ap—0 to 10 inches; dark yellowish brown (10YR 3/4) loamy sand; single grained; loose; common fine roots; slightly acid; clear smooth boundary.

C1—10 to 24 inches; dark yellowish brown (10YR 4/4) loamy sand; single grained; loose; common fine roots; strongly acid; clear wavy boundary.

C2—24 to 42 inches; strong brown (7.5YR 5/6) sand; single grained; loose; few fine and very fine roots; strongly acid; gradual wavy boundary.

C3—42 to 50 inches; yellowish brown (10YR 5/6) sand; single grained; loose; gradual wavy boundary.

C4—50 to 69 inches; very pale brown (10YR 7/3) sand; single grained; loose; few fine distinct brownish yellow (10YR 6/6) masses of iron accumulation; strongly acid; clear wavy boundary.

C5—69 to 80 inches; brownish yellow (10YR 6/6) sand; single grained; loose; common fine faint very pale brown (10YR 7/3) iron depletions; strongly acid.

The thickness of the sandy sediments is more than 80 inches. Reaction is very strongly acid to moderately acid throughout the profile, except in areas where lime has been added.

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

The upper part of the C horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 6. Texture is loamy sand, sand, or fine sand.

The lower part of the C horizon has hue of 10YR, value of 5 to 7, and chroma of 2 to 6. It has few to common iron accumulations in shades of yellow or brown. Texture is sand, loamy sand, or fine sand.

Bonneau Series

The Bonneau series consists of very deep, well drained soils on stream terraces (fig. 14). These soils formed in sandy and loamy sediments. Slopes range from 0 to 8 percent.

Soils of the Bonneau series are loamy, siliceous, thermic Arenic Paleudults.

Bonneau soils are commonly associated on the landscape with Benndale, Eunola, and Lynchburg soils. Benndale and Eunola soils are in landscape positions similar to those of the Bonneau soils. They do not have a thick, sandy epipedon. The somewhat poorly drained Lynchburg soils are in lower positions than the Bonneau soils.

Typical pedon of Bonneau loamy sand, 0 to 5 percent slopes, about 3 miles east of Georgiana, 1,980 feet west and 850 feet south of the northeast corner of sec. 30, T. 8 N., R. 14 E.

Ap—0 to 6 inches; grayish brown (10YR 5/2) loamy sand; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

E1—6 to 11 inches; brown (10YR 5/3) loamy sand; single grained; loose; common fine roots; moderately acid; clear smooth boundary.

E2—11 to 23 inches; brownish yellow (10YR 6/6) loamy sand; single grained; loose; common fine roots; common fine faint pale brown (10YR 6/3) iron depletions; strongly acid; clear smooth boundary.

Bt1—23 to 41 inches; light olive brown (2.5Y 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of some peds; common fine faint pale brown (10YR 6/3) iron depletions; very strongly acid; gradual wavy boundary.

Bt2—41 to 59 inches; olive yellow (2.5Y 6/6) sandy clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of some peds; common fine distinct light brownish gray (2.5Y 6/2) iron depletions; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt3—59 to 72 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of some peds; common medium distinct light brownish gray (2.5Y 6/2) iron depletions; common medium prominent yellowish red (5YR 5/6) masses of iron accumulation; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches. Reaction ranges from very strongly acid to moderately acid in the A and E horizons and from very strongly acid to strongly acid in the Bt horizon.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 2 to 6. Texture is loamy sand or loamy fine sand.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 8. It has few to many iron accumulations in shades of brown, red, or yellow and iron depletions in shades of brown and gray. The texture is commonly sandy loam or sandy clay loam, but it ranges to sandy clay in the lower part.

Brantley Series

The Brantley series consists of very deep, well drained soils on the side slopes of uplands in the northwestern part of the county. These soils formed in clayey and loamy sediments. Slopes range from 15 to 35 percent.

Soils of the Brantley series are fine, mixed, thermic Ultic Hapludalfs.

Brantley soils are commonly associated on the landscape with Demopolis, Oktibbeha, Searcy, Sumter, and Watsonia soils. Demopolis and Watsonia soils are on slightly higher ridgetops or in similar positions on side slopes. They are shallow over bedrock. Oktibbeha and Searcy soils are in lower, less sloping positions than the Brantley soils. Oktibbeha soils have a very fine textured argillic horizon. Searcy soils are moderately well drained and have a solum thickness of 60 inches or more. Sumter soils are in higher landscape positions than the Brantley soils. They are moderately deep over bedrock.

Typical pedon of Brantley loam, in an area of Demopolis-Brantley complex, 15 to 35 percent slopes; about 18 miles northwest of Greenville, 250 feet east and 1,100 feet south of the northwest corner of sec. 3, T. 11 N., R. 12 E.

A—0 to 3 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

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

Bt1—6 to 16 inches; strong brown (7.5YR 5/6) clay; moderate medium subangular blocky structure; firm; few fine roots; few faint clay films on faces of some peds; few fine black nodules and stains of manganese oxide; few fine flakes of mica; strongly acid; clear wavy boundary.

Bt2—16 to 36 inches; dark yellowish brown (10YR 4/4) clay; moderate medium angular blocky structure; firm; common distinct clay films on faces of most peds; few fine black nodules and stains of manganese oxide; common fine flakes of mica; strongly acid; clear wavy boundary.

Bt3—36 to 56 inches; yellowish brown (10YR 5/6) sandy clay loam; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; few fine black nodules and stains of manganese oxide; many fine flakes of mica; strongly acid; clear wavy boundary.

C—56 to 72 inches; yellowish brown (10YR 5/6) fine sandy loam; massive; friable; many fine flakes of mica; common medium faint yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) masses of iron accumulation; strongly acid.

The thickness of the solum ranges from 40 to 60 inches. Reaction is very strongly acid or strongly acid throughout the profile.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4.

The BA horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8. Texture is loam or fine sandy loam.

The Bt horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 8. Texture is clay, sandy clay, or clay loam in the upper part and clay loam or sandy clay loam in the lower part.

The C horizon has hue of 7.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. Some pedons have few to common iron accumulations in shades of brown and red and few to common iron depletions in shades of gray. Texture is fine sandy loam, sandy clay loam, or loamy fine sand.

Cahaba Series

The Cahaba series consists of very deep, well drained soils on low terraces that are adjacent to the major streams. These soils formed in loamy alluvium. Cahaba soils are rarely flooded, but they may be flooded during periods of unusually heavy and prolonged rainfall. Slopes range from 0 to 2 percent.

Soils of the Cahaba series are fine-loamy, siliceous, thermic Typic Hapludults.

Cahaba soils are commonly associated on the landscape with Bethera, Bibb, Bigbee, Eunola, Iuka, and Mantachie soils. The poorly drained Bethera soils are on lower terraces. They have a clayey argillic horizon. The excessively drained Bigbee soils are in landscape positions similar to those of the Cahaba soils. They are sandy throughout the profile. The moderately well drained Eunola soils are in slightly lower, less convex positions. They have a yellowish brown subsoil. The poorly drained Bibb soils, the moderately well drained Iuka soils, and the somewhat poorly drained Mantachie soils are in lower positions on flood plains.

Typical pedon of Cahaba fine sandy loam, 0 to 2 percent slopes, rarely flooded, about 4.5 miles southwest of Forest Home, 2,200 feet east and 50 feet south of the northwest corner of sec. 33, T. 10 N., R. 12 E.

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

E—10 to 18 inches; yellowish brown (10YR 5/4) fine sandy loam; weak coarse subangular blocky structure; very friable; common fine roots; moderately acid; clear smooth boundary.

Bt1—18 to 38 inches; yellowish red (5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of some peds and in pores; moderately acid; clear wavy boundary.

Bt2—38 to 48 inches; yellowish red (5YR 4/6) sandy clay loam; weak coarse subangular blocky structure; friable; few faint clay films on faces of some peds and in pores; very strongly acid; clear wavy boundary.

C—48 to 60 inches; yellowish red (5YR 5/6) fine sandy loam; massive; very friable; few thin strata of loamy sand; few fine flakes of mica.

The thickness of the solum ranges from 36 to 60 inches. Reaction ranges from very strongly acid to moderately acid throughout the profile, except for the surface layer in areas where lime has been added.

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

The E horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is sandy loam, fine sandy loam, or loamy fine sand.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 to 8. Texture is clay loam, sandy clay loam, or loam.

The C horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 6. Texture is fine sandy loam, sandy loam, or loamy sand. Strata of coarser or finer textured material are common.

Congaree Series

The Congaree series consists of very deep, well drained soils on flood plains of streams in the northwestern part of the county. These soils formed in loamy alluvium. Congaree soils are subject to frequent flooding for brief periods in winter and spring of most years. Slopes range from 0 to 1 percent.

Soils of the Congaree series are fine-loamy, mixed, nonacid, thermic Typic Udifluvents.

Congaree soils are commonly associated on the landscape with Leeper and Macon soils. The somewhat poorly drained Leeper soils are in slightly lower positions on the flood plain. They have a clayey subsoil. Macon soils are on adjacent terraces and have a loamy argillic horizon.

Typical pedon of Congaree loam, 0 to 1 percent slopes, frequently flooded, about 17 miles northwest of Greenville, 2,400 feet west and 2,000 feet south of the northeast corner of sec. 3, T. 11 N., R. 12 E.

Ap—0 to 8 inches; dark brown (7.5YR 4/2) loam; weak fine granular structure; friable; many fine roots; few fine flakes of mica; slightly acid; clear smooth boundary.

C1—8 to 22 inches; dark yellowish brown (10YR 4/4) loam; massive; friable; many fine roots; common fine flakes of mica; few thin strata of light yellowish brown (10YR 6/4) sandy loam; neutral; gradual wavy boundary.

C2—22 to 31 inches; brown (10YR 4/3) fine sandy loam; massive; friable; common fine roots; common fine flakes of mica; few thin strata of light yellowish brown (10YR 6/4) sandy loam; neutral; gradual wavy boundary.

C3—31 to 58 inches; dark yellowish brown (10YR 4/4) fine sandy loam; massive; very friable; few fine flakes of mica; few thin strata of light yellowish brown (10YR 6/4) sandy loam; neutral; clear wavy boundary.

C4—58 to 65 inches; brown (10YR 5/3) loamy sand; single grained; loose; few fine flakes of mica; neutral.

Reaction ranges from strongly acid to neutral throughout the profile.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4.

The C horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 3 to 6. Texture is fine sandy loam or loam in the upper part and ranges from loamy sand to silty clay in the lower part. Most pedons have thin strata of finer or coarser textured material.

Demopolis Series

The Demopolis series consists of shallow, well drained soils on ridgetops and side slopes in the northwestern part of the county. These soils formed in material weathered from soft limestone. Slopes range from 2 to 35 percent.

Soils of the Demopolis series are loamy, carbonatic, thermic, shallow Typic Udorthents.

Demopolis soils are commonly associated on the landscape with Brantley, Searcy, Sumter, and Watsonia soils. Brantley soils are in similar positions on side slopes. They are very deep. Searcy and Sumter soils are on lower slopes. Searcy soils are very deep. Sumter soils are moderately deep. Watsonia soils are in landscape positions similar to those of the Demopolis soils. They are clayey and are acid in the upper part of the subsoil.

Typical pedon of Demopolis loam, in an area of Demopolis-Watsonia complex, 2 to 8 percent slopes; about 17 miles northwest of Greenville, 200 feet east and 1,200 feet south of the northwest corner of sec. 4, T. 11 N., R. 12 E.

A—0 to 4 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; friable; many fine roots; about 10 percent soft fragments of limestone; common fine and medium concretions of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

C—4 to 10 inches; dark grayish brown (2.5Y 4/2) loam; weak fine and medium granular structure; very friable; common fine roots; about 10 percent fragments of soft limestone; many fine and medium concretions and soft calcium carbonate masses; strongly effervescent; moderately alkaline; abrupt irregular boundary.

Cr—10 to 60 inches; light yellowish brown (2.5Y 6/3) soft limestone with strata of hard limestone; weak medium and thick platy rock structure; can be cut with hand tools and is rippable by light machinery; violently effervescent; moderately alkaline.

The depth to bedrock is 10 to 20 inches. Reaction is slightly alkaline or moderately alkaline throughout the profile.

The A horizon has hue of 10YR to 2.5Y, value of 3 or 4, and chroma of 2 to 4. The content of limestone fragments ranges from 5 to 15 percent. This horizon has few to many concretions and soft masses of calcium carbonate.

The C horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. Texture is commonly loam, silty clay loam, or clay loam, but it includes channery or cobbly silty clay loam. The content of channers or cobbles of soft limestone ranges from 5 to 35 percent. The content of concretions or soft masses of calcium carbonate ranges from common to many.

The Cr horizon is level-bedded, soft limestone (chalk). It can be cut with hand tools and is rippable by light machinery. Thin, discontinuous strata of hard limestone are in some areas.

Eunola Series

The Eunola series consists of very deep, moderately well drained soils on low terraces that are adjacent to the major streams. These soils formed in loamy and sandy alluvium. Eunola soils are rarely flooded, but they may be flooded during periods of unusually heavy and prolonged rainfall. Slopes range from 0 to 2 percent.

Soils of the Eunola series are fine-loamy, siliceous, thermic Aquic Hapludults.

Eunola soils are commonly associated on the landscape with Bethera, Bibb, Bigbee, Bonneau, Cahaba, Iuka, Lynchburg, and Mantachie soils. The poorly drained Bethera soils are in lower landscape positions. The poorly drained Bibb soils, the moderately well drained Iuka soils, and the somewhat poorly drained Mantachie soils are in lower positions on stream flood plains. Bigbee, Bonneau, Cahaba, and Lynchburg soils are in landscape positions similar to those of the Eunola soils. Bigbee soils are sandy throughout the profile. Bonneau soils have a thick, sandy epipedon. The well drained Cahaba soils have a reddish subsoil. Lynchburg soils are somewhat poorly drained.

Typical pedon of Eunola sandy loam, 0 to 2 percent slopes, about 2 miles northeast of Georgiana, 210 feet east and 1,560 feet south of the northwest corner of sec. 24, T. 8 N., R. 13 E.

Ap—0 to 8 inches; brown (10YR 5/3) sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bt1—8 to 30 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of some peds; few fine distinct light brownish gray (10YR 6/2) iron depletions; very strongly acid; clear wavy boundary.

Bt2—30 to 44 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; few faint clay films on faces of some peds; common medium distinct light brownish gray (10YR 6/2) iron depletions; few fine prominent yellowish red (5YR 4/6) masses of iron accumulation; very strongly acid; clear wavy boundary.

BC—44 to 54 inches; yellowish brown (10YR 5/6) sandy loam; weak coarse subangular blocky structure; very friable; sand grains coated and bridged with clay; common medium distinct light gray (10YR 6/1) iron depletions; common medium prominent yellowish red (5YR 4/6) masses of iron accumulation; very strongly acid; clear wavy boundary.

2C—54 to 62 inches; yellowish brown (10YR 5/6) sand; single grained; loose; many medium distinct light brownish gray (10YR 6/2) and light yellowish brown (10YR 6/4) iron depletions; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction is very strongly acid or strongly acid throughout the profile, except for the surface layer in areas where lime has been added.

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

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. Texture is clay loam, sandy clay loam, or sandy loam. This horizon has few to many iron depletions in shades of brown and gray and iron accumulations in shades of yellow, brown, or red.

The BC horizon, if it occurs, has colors similar to those of the Bt horizon. Texture is sandy clay loam or sandy loam.

The 2C horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 6. Texture is sand, loamy sand, or fine sand. Thin strata of finer or coarser textured material are common.

Greenville Series

The Greenville series consists of very deep, well drained soils on broad ridgetops and on side slopes of the uplands. These soils formed in clayey sediments. Slopes range from 1 to 15 percent.

Soils of the Greenville series are clayey, kaolinitic, thermic Rhodic Kandiudults.

Greenville soils are commonly associated on the landscape with Lucedale, Orangeburg, Rains, and Smithdale soils. Lucedale and Orangeburg soils are in landscape positions similar to those of the Greenville soils but are at slightly lower elevations. They are loamy throughout the profile. The poorly drained Rains soils and the Smithdale soils are in lower positions. They are loamy throughout the profile.

Typical pedon of Greenville sandy loam, 1 to 3 percent slopes, about 2 miles northeast of Greenville, 400 feet south and 1,550 feet east of the northwest corner of sec. 8, T. 10 N., R. 15 E.

Ap—0 to 8 inches; dark reddish brown (5YR 3/4) sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bt1—8 to 22 inches; dark red (10R 3/6) clay loam; moderate medium subangular blocky structure; firm; common fine and medium roots; few faint clay films on faces of some peds; strongly acid; gradual wavy boundary.

Bt2—22 to 54 inches; dark red (10R 3/6) clay; moderate medium subangular blocky structure; firm; few faint clay films on faces of most peds; strongly acid; gradual wavy boundary.

Bt3—54 to 74 inches; dark red (10R 3/6) clay; weak coarse subangular blocky structure; firm; few faint clay films on faces of some peds; strongly acid.

The thickness of the solum is more than 60 inches. Reaction ranges from very strongly acid to moderately acid throughout the profile, except for the surface layer in areas where lime has been added.

The A or Ap horizon has hue of 2.5YR to 7.5YR, value of 3 or 4, and chroma of 2 to 4. Texture is sandy loam or sandy clay loam.

The Bt horizon has hue of 10R or 2.5YR, value of 3, and chroma of 4 to 6. Texture is clay, sandy clay, or clay loam.

Halso Series

The Halso series consists of deep, moderately well drained soils on ridgetops and side slopes of the uplands. These soils formed in clayey sediments and the underlying shale. Slopes range from 1 to 8 percent.

Soils of the Halso series are clayey, montmorillonitic, thermic Aquic Hapludults.

Halso soils are commonly associated on the landscape with Arundel and Luverne soils. Arundel soils are in landscape positions similar to those of the Halso soils. They are moderately deep over bedrock. Luverne soils are in slightly higher landscape positions. They do not have bedrock within a depth of 60 inches.

Typical pedon of Halso silt loam, 1 to 3 percent slopes, about 2 miles northwest of Bolling, 525 feet west and 600 feet south of the northeast corner of sec. 22, T. 9 N., R. 13 E.

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

BA—3 to 5 inches; yellowish red (5YR 4/6) clay loam; moderate medium subangular blocky structure; friable; many fine roots; very strongly acid; abrupt smooth boundary.

Bt1—5 to 13 inches; dark reddish brown (2.5YR 3/4) clay; strong fine and medium angular blocky structure; firm; common fine and medium roots; distinct continuous clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—13 to 25 inches; red (2.5YR 4/6) clay; strong fine and medium angular blocky structure; firm; few fine and medium roots; distinct continuous clay films on faces of peds; common medium distinct light yellowish brown (2.5Y 6/4) masses of iron accumulation; common medium distinct light brownish gray (2.5Y 6/2) iron depletions; extremely acid; clear wavy boundary.

Bt3—25 to 33 inches; red (2.5YR 4/6) clay; moderate medium angular blocky structure; firm; few fine roots; distinct continuous clay films on faces of peds; many fine and medium distinct yellowish red (5YR 4/6) and light yellowish brown (2.5Y 6/4) masses of iron accumulation; many fine and medium distinct light olive gray (5Y 6/2) iron depletions; extremely acid; abrupt smooth boundary.

C/B—33 to 48 inches; 80 percent light brownish gray (10YR 6/2) clayey shale in the C part; weak thick platy rock structure; 20 percent light yellowish brown (2.5Y 6/4) clay loam in the B part; weak fine subangular blocky structure; few fine roots; many medium and coarse strong brown (7.5YR 5/8) and red (2.5YR 4/6) masses of iron accumulation; extremely acid; abrupt irregular boundary.

Cr—48 to 60 inches; light brownish gray (10YR 6/2) clayey shale; strong thick platy rock structure; many medium and coarse prominent strong brown (7.5YR 5/8) and red (2.5YR 4/6) masses of iron accumulation; extremely acid.

The thickness of the solum ranges from 25 to 50 inches, and the depth to soft shale bedrock ranges from 40 to 60 inches. Reaction ranges from extremely acid to strongly acid throughout the profile, except for the surface layer in areas where lime has been added.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. It is silt loam or fine sandy loam.

The BA horizon, if it occurs, has hue of 5YR, value of 3 or 4, and chroma of 4 to 6. Texture is clay loam, silty clay loam, silty clay, or clay.

The upper part of the Bt horizon has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 4 to 8. Texture is clay loam, silty clay loam, or silty clay.

The lower part of the Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, chroma of 4 to 8, and common to many iron depletions in shades of gray and iron accumulations in shades of red, yellow, and brown; or it has no dominant matrix color and is multicolored in shades of gray, red, brown, and yellow. Texture is clay or silty clay.

The C part of the C/B horizon is weathered shale. It has thick, platy rock structure and has a wide range in colors. The B part has hue of 5YR to 2.5Y, value of 4 to 7, and chroma of 1 to 6. It has common to many iron accumulations in shades of red, yellow, and brown. Texture ranges from sandy clay loam to clay.

The Cr horizon is clayey shale that can be cut with hand tools and is rippable by light machinery.

Iuka Series

The Iuka series consists of very deep, well drained soils on stream flood plains. These soils formed in stratified loamy and sandy alluvium. Iuka soils are subject to frequent flooding for brief periods one or more times each year. Slopes range from 0 to 1 percent.

Soils of the Iuka series are coarse-loamy, siliceous, acid, thermic Aquic Udifluvents.

Iuka soils are commonly associated on the landscape with Bibb, Bigbee, Cahaba, Eunola, and Mantachie soils. The poorly drained Bibb soils are in slightly lower, more concave positions on the flood plain. The excessiveiy drained Bigbee soils, the well drained Cahaba soils, and the moderately well drained Eunola soils are on adjacent low terraces. The somewhat poorly drained Mantachie soils are in slightly lower positions on the flood plain.

Typical pedon of Iuka loam, in an area of Mantachie, Bibb, and Iuka soils, 0 to 1 percent slopes, frequently flooded; about 9 miles northeast of Greenville, 1,600 feet east and 700 feet south of the northwest corner of sec. 30, T. 11 N., R. 16 E.

A1—0 to 5 inches; brown (10YR 4/3) loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

A2—5 to 12 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.

C1—12 to 18 inches; brown (10YR 4/3) loam; massive; very friable; few fine roots; few fine flakes of mica; common fine distinct light brownish gray (10YR 6/2) iron depletions; common medium faint dark yellowish brown (10YR 4/4) masses of iron accumulation; very strongly acid; clear wavy boundary.

C2—18 to 30 inches; yellowish brown (10YR 5/6) sandy loam; massive; very friable; few fine roots; few fine flakes of mica; few thin strata of finer and coarser textured material; common fine and medium distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) iron depletions; very strongly acid; gradual wavy boundary.

Cg1—30 to 48 inches; light brownish gray (10YR 6/2) sandy loam; massive; very friable; few fine flakes of mica; few thin strata of finer and coarser textured material; many medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation; very strongly acid; clear wavy boundary.

Cg2—48 to 60 inches; grayish brown (10YR 5/2) loamy sand; singled grained; loose; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation; very strongly acid.

Reaction is very strongly acid or strongly acid throughout the profile. Thin strata of contrasting textures are common in most pedons.

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

The C horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. It has iron depletions that have chroma of 2 or less within a depth of 20 inches. Texture is fine sandy loam, sandy loam, or loam.

The Cg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It has few to many iron accumulations in shades of brown, red, or yellow. Texture is fine sandy loam, sandy loam, or loamy sand.

Leeper Series

The Leeper series consists of very deep, somewhat poorly drained soils on flood plains of streams in the northwestern part of the county (fig. 15). These soils formed in clayey alluvium. Leeper soils are subject to flooding for brief periods one or more times each year. Slopes range from 0 to 1 percent.

Soils of the Leeper series are fine, montmorillonitic, nonacid, thermic Vertic Epiaquepts.

Leeper soils are commonly associated on the landscape with Congaree, Macon, and Searcy soils. Congaree soils are on the slightly higher parts of the flood plain. They are loamy throughout the profile. Macon soils are on adjacent terraces, and they have a loamy argillic horizon. Searcy soils are on adjacent side slopes, and they have a clayey argillic horizon.

Typical pedon of Leeper clay loam, 0 to 1 percent slopes, frequently flooded, about 17 miles northwest of Greenville, 1,200 feet north and 1,000 feet west of the southeast corner of sec. 3, T. 11 N., R. 12 E.

Ap—0 to 3 inches; brown (10YR 4/3) clay loam; weak fine and medium granular structure; firm; many very fine and medium roots; common medium distinct grayish brown (10YR 5/2) iron depletions; slightly acid; clear smooth boundary.

Bw1—4 to 13 inches; dark grayish brown (10YR 4/2) silty clay; weak medium subangular blocky structure; firm; common fine and few medium roots; many pressure faces; few streaks of brown (10YR 4/3) clay loam in cracks; few fine black concretions of manganese oxide; common medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation; neutral; gradual wavy boundary.

Bw2—13 to 24 inches; dark grayish brown (2.5Y 4/2) silty clay; moderate medium subangular blocky structure; firm; many fine and medium roots; common pressure faces; few streaks of brown (10YR 4/3) clay loam in

Figure 13.—A profile of Arundel fine sandy loam. The clayey argillic horizon overlies claystone (buhrstone) bedrock at a depth of about 30 inches.

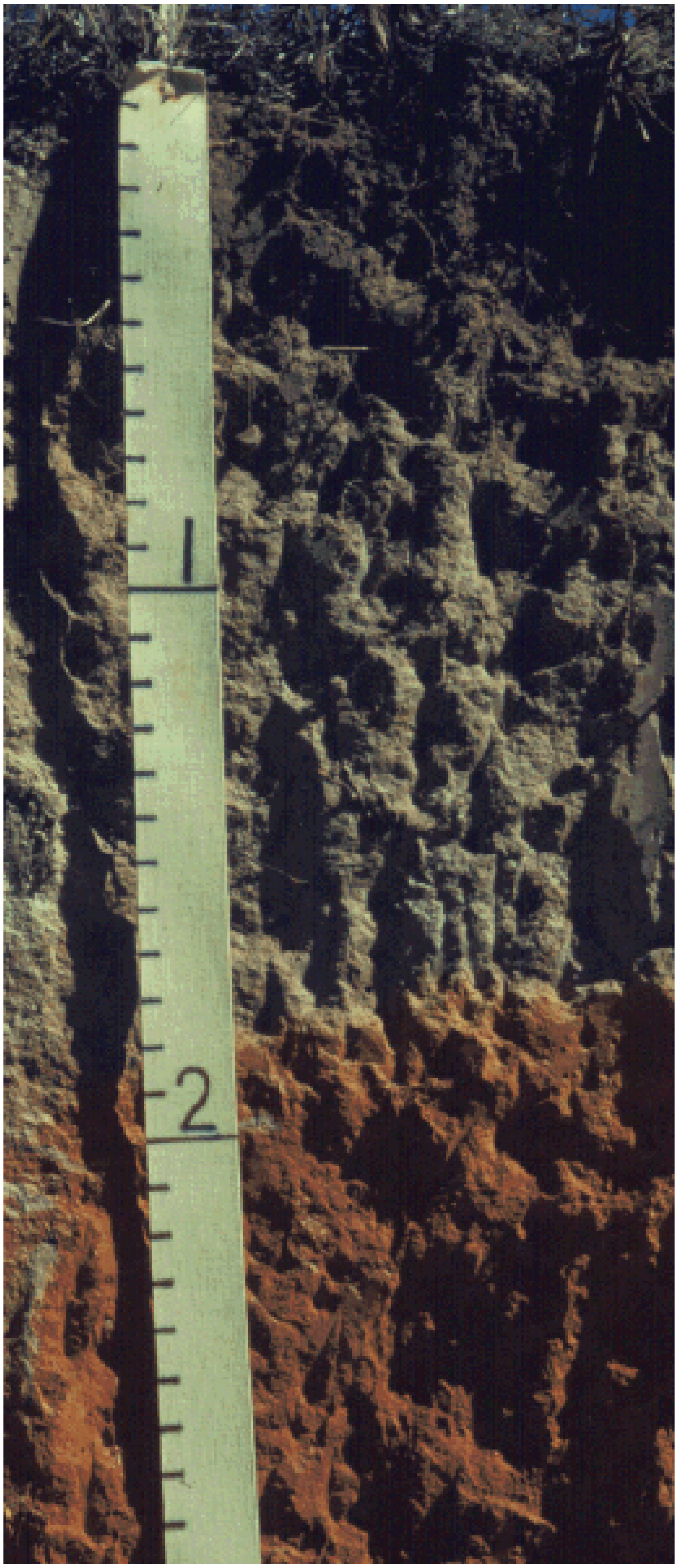

Figure 14.—A profile of Bonneau loamy sand. The surface and subsurface layers are loamy sand, and they overlie a sandy clay loam argillic horizon at a depth of about 22 inches.

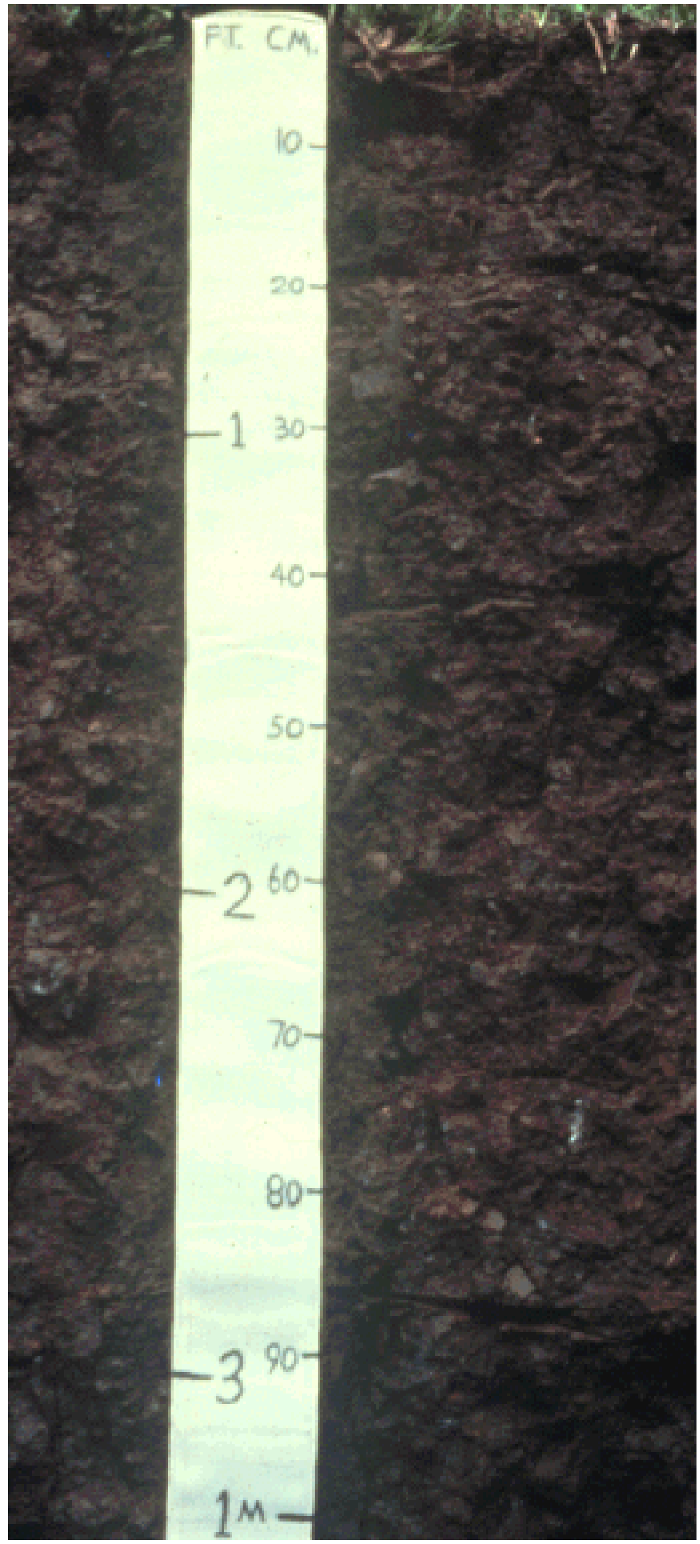

Figure 15.—A profile of Leeper clay. These dark-colored, alkaline, clayey soils formed in material eroded from the surrounding uplands.

Figure 16.—A profile of Luverne sandy loam. The reddish, clayey argillic horizon has strong blocky structure in the upper part.

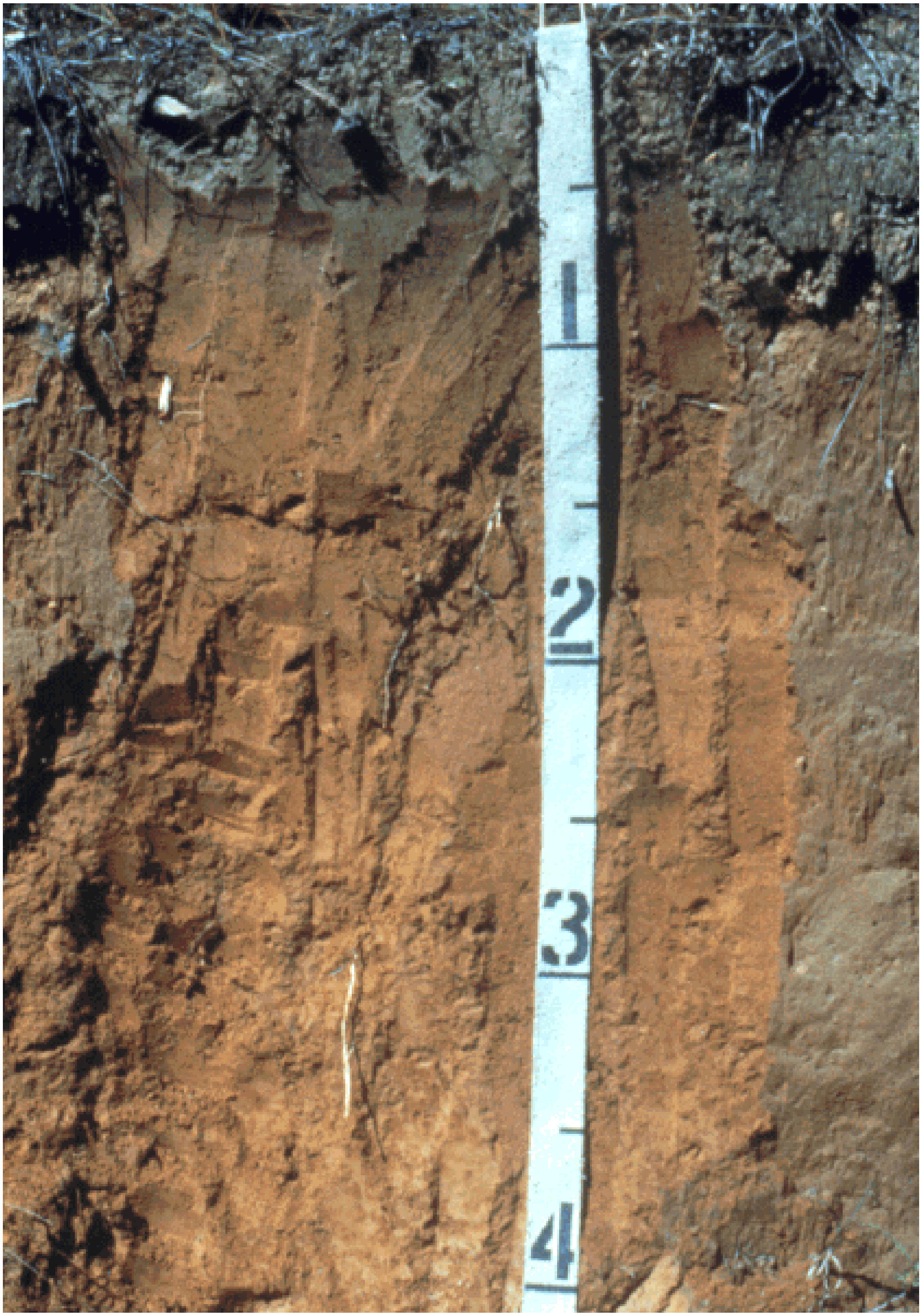

Figure 17.—A profile of Malbis fine sandy loam. Nodular plinthite is at a depth of about 36 inches.

cracks; few charcoal fragments; few fine black concretions of manganese oxide; common medium distinct brown (10YR 4/3) masses of iron accumulation; neutral; gradual wavy boundary.

Bg1—24 to 36 inches; dark gray (10YR 4/1) clay; weak coarse subangular blocky structure parting to strong medium angular blocky; firm; many pressure faces; few fine black concretions of manganese oxide; common fine and medium dark brown (7.5YR 4/4) masses of iron accumulation; neutral; clear wavy boundary.

Cg—36 to 60 inches; gray (10YR 5/1) silty clay; massive; firm; many pressure faces; few fine black concretions of manganese oxide; common medium distinct olive brown (2.5Y 4/4) and strong brown (7.5YR 5/6) masses of iron accumulation; moderately alkaline.

The thickness of the solum ranges from 20 to more than 60 inches. Reaction ranges from slightly acid to moderately alkaline throughout the profile.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 to 3.

The Bw horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2. It has common to many iron accumulations in shades of brown and iron depletions in shades of gray. Texture is clay or silty clay.

The Bg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It has few to many iron accumulations in shades of brown. Texture is clay, silty clay, or clay loam.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2; or it has no dominant matrix color and is multicolored in shades of gray, brown, and yellow. Texture is clay, silty clay loam, or clay loam.

Lucedale Series

The Lucedale series consists of very deep, well drained soils on broad ridgetops in the uplands. These soils formed in loamy sediments. Slopes range from 1 to 8 percent.

Soils of the Lucedale series are fine-loamy, siliceous, thermic Rhodic Paleudults.

Lucedale soils are commonly associated with Greenville, Orangeburg, and Rains soils. Greenville soils are in landscape positions similar to those of the Lucedale soils but at slightly higher elevations. They have a clayey argillic horizon. Orangeburg soils are in landscape positions similar to those of the Lucedale soils. They do not have dark red colors throughout the argillic horizon. The poorly drained Rains soils are in lower positions on the landscape than the Lucedale soils.

Typical pedon of Lucedale sandy loam, 1 to 3 percent slopes, about 3 miles southwest of Forest Home, 750 feet south and 375 feet west of the northeast corner of sec. 20, T. 10 N., R. 12 E.

Ap—0 to 8 inches; dark reddish brown (5YR 3/4) sandy loam; weak fine granular structure; very friable; many fine roots; moderately acid; clear smooth boundary.

Bt1—8 to 26 inches; dark red (2.5YR 3/6) loam; weak medium subangular blocky structure; friable; common fine roots; few faint clay films on faces of some peds; strongly acid; gradual wavy boundary.

Bt2—26 to 52 inches; dark red (2.5YR 3/6) sandy clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; few fine black stains on faces of some peds; strongly acid; gradual wavy boundary.

Bt3—52 to 72 inches; dark red (2.5YR 3/6) sandy clay loam; weak coarse subangular blocky structure; friable; few faint clay films on faces of peds; strongly acid.

The thickness of the solum is more than 60 inches.

The Ap horizon has hue of 2.5YR to 7.5YR, value of 3, and chroma of 2 to 4. Reaction ranges from strongly acid to slightly acid.

The Bt horizon has hue of 10R or 2.5YR, value of 3, and chroma of 4 to 6. Texture is loam, sandy clay loam, or clay loam. Reaction is very strongly acid or strongly acid.

Lucy Series

The Lucy series consists of very deep, well drained soils on narrow ridgetops in the uplands. These soils formed in sandy and loamy sediments. Slopes range from 0 to 5 percent.

Soils of the Lucy series are loamy, siliceous, thermic Arenic Kandiudults.

Lucy soils are commonly associated on the landscape with Alaga, Orangeburg, and Troup soils. Alaga and Troup soils are in lower landscape positions. They have a sandy epipedon more than 40 inches thick. Orangeburg soils are in landscape positions similar to those of the Lucy soils. They do not have a thick sandy epipedon.

Typical pedon of Lucy loamy sand, 0 to 5 percent slopes, about 10 miles northeast of Greenville, 1,400 feet west and 1,000 feet north of the southeast corner of sec. 24, T. 11 N., R. 15 E.

Ap—0 to 8 inches; brown (10YR 5/3) loamy sand; weak fine granular structure; very friable; many fine roots; moderately acid; clear smooth boundary.

E1—8 to 18 inches; brown (7.5YR 4/4) loamy sand; single grained; loose; few fine roots; strongly acid; clear smooth boundary.

E2—18 to 33 inches; brown (7.5YR 4/4) loamy sand; single grained; loose; common thin streaks of very pale brown (10YR 7/3) sand; strongly acid; clear smooth boundary.

BE—33 to 38 inches; yellowish red (5YR 5/8) sandy loam; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay; common thin

streaks of very pale brown (10YR 7/3) sand; strongly acid; clear wavy boundary.
Bt—38 to 60 inches; yellowish red (5YR 4/6) sandy clay loam; weak coarse subangular blocky structure; friable; few faint clay films on faces of some peds; strongly acid.

The thickness of the solum is more than 60 inches. Reaction ranges from strongly acid to moderately acid in the A and E horizons, except in areas that have been limed. It is very strongly acid or strongly acid in the subsoil.

The A or Ap horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 or 3.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 3 to 8. Texture is loamy sand or loamy fine sand. The combined thickness of the A and E horizons is 20 to 40 inches.

The BE horizon, if it occurs, has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 6 or 8. Texture is fine sandy loam or sandy loam.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8. Texture is commonly sandy clay loam, but it includes sandy loam in the upper part.

Luverne Series

The Luverne series consists of very deep, well drained soils on ridgetops and side slopes in the uplands (fig. 16). These soils formed in stratified clayey and loamy sediments. Slopes range from 1 to 35 percent.

Soils of the Luverne series are clayey, mixed, thermic Typic Hapludults.

Luverne soils are commonly associated on the landscape with Arundel, Halso, Orangeburg, Smithdale, and Troup soils. Arundel and Halso soils are in landscape positions similar to those of the Luverne soils but at lower elevations. Arundel soils are moderately deep over bedrock, and Halso soils are deep over bedrock. Orangeburg soils are in higher landscape positions than the Luverne soils, and they are loamy throughout. Smithdale and Troup soils are in landscape positions similar to those of the Luverne soils. Smithdale soils are loamy throughout. Troup soils have a thick, sandy epipedon and a loamy subsoil.

Typical pedon of Luverne sandy loam, 5 to 8 percent slopes, about 4 miles southeast of Georgiana, 2,200 feet east and 2,400 feet north of the southwest corner of sec. 4, T. 7 N., R. 14 E.

Ap—0 to 4 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine roots; few fine fragments of charcoal; extremely acid; clear smooth boundary.
E—4 to 11 inches; light yellowish brown (10YR 6/4) sandy loam; weak coarse subangular blocky structure; very friable; common fine roots; few fine fragments of charcoal; very strongly acid; clear smooth boundary.
Bt1—11 to 23 inches; yellowish red (5YR 4/6) clay; strong medium subangular blocky structure; firm; few fine roots; common faint clay films on faces of peds; extremely acid; clear wavy boundary.
Bt2—23 to 28 inches; yellowish red (5YR 4/6) sandy clay; moderate medium subangular blocky structure; firm; few fine roots; common faint clay films on faces of peds; few fine flakes of mica; extremely acid; clear wavy boundary.
Bt3—28 to 32 inches; red (2.5YR 4/6) clay; weak medium subangular blocky structure; friable; few faint clay films on faces of some peds; few fine fragments of shale; common fine flakes of mica; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation; extremely acid; clear wavy boundary.
Bt4—32 to 40 inches; yellowish red (5YR 4/6) clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; common fine soft fragments of shale; common fine flakes of mica; extremely acid; clear wavy boundary.
C—40 to 60 inches; thinly stratified yellowish red (5YR 4/6) sandy loam, light gray (10YR 6/1) clay, and strong brown (7.5YR 5/6) sandy clay loam; weak medium platy structure; friable; many fine flakes of mica; areas of light gray clay are relic redoximorphic features; extremely acid.

The thickness of the solum ranges from 20 to 50 inches. Reaction ranges from extremely acid to strongly acid throughout the profile, except for the surface layer in areas where lime has been added.

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

The E horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is sandy loam or fine sandy loam.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. It has few to common fine flakes of mica. Texture is clay, clay loam, or sandy clay. Many pedons have soft shale fragments in the lower part of the Bt horizon.

Some pedons have a thin BC horizon that has colors similar to those of the Bt horizon. Texture is clay loam or sandy clay loam.

The C horizon consists of stratified, loamy to clayey sediments that have a high content of mica. The texture of individual strata ranges from loamy sand to clay, and the thickness of individual strata ranges from a few millimeters to several centimeters. Some pedons have few to common thin strata of clayey shale. The colors are variable, but sandy and loamy strata commonly have hue of 2.5YR to

7.5YR, value of 4 to 6, and chroma of 5 to 8. The clayey strata are generally gray in color.

Lynchburg Series

The Lynchburg series consists of very deep, somewhat poorly drained soils on low terraces, low areas of broad interstream divides, and toe slopes. These soils formed in loamy sediments. Slopes range from 0 to 2 percent.

Soils of the Lynchburg series are fine-loamy, siliceous, thermic Aeric Paleaquults.

Lynchburg soils are commonly associated on the landscape with Bethera, Bonneau, Eunola, and Rains soils. The poorly drained Bethera and Rains soils are on lower terraces. The moderately well drained Eunola and well drained Bonneau soils are in slightly higher, more convex positions on low terraces.

Typical pedon of Lynchburg sandy loam, 0 to 2 percent slopes, about 0.75 mile east of Georgiana, 2,000 feet north and 2,450 feet east of the southwest corner of sec. 26, T. 8 N., R. 13 E.

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

E—6 to 11 inches; brown (10YR 5/3) fine sandy loam; weak coarse subangular blocky structure; very friable; many fine roots; common medium faint grayish brown (10YR 5/2) iron depletions; very strongly acid; clear wavy boundary.

Bt—11 to 16 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium subangular blocky structure; friable; common fine roots; few faint clay films on faces of some peds; few fine distinct light brownish gray (10YR 6/2) and common medium distinct pale brown (10YR 6/3) iron depletions; common medium distinct brown (7.5YR 5/4) masses of iron accumulation; very strongly acid; clear wavy boundary.

Btg1—16 to 40 inches; light brownish gray (10YR 6/2) clay loam; moderate medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of some peds; common medium distinct yellowish red (5YR 4/6) and yellowish brown (10YR 5/4) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btg2—40 to 50 inches; light brownish gray (10YR 6/2) clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of some peds; many medium distinct brownish yellow (10YR 6/6) and common medium distinct reddish yellow (7.5YR 6/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btg3—50 to 65 inches; gray (10YR 6/1) sandy clay; weak medium subangular blocky structure; few faint clay films on faces of some peds; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction ranges from extremely acid to strongly acid throughout the profile, except for the surface layer in areas where lime has been added.

The A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 4. Texture is sandy loam or fine sandy loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 8. It has few to many iron depletions in shades of gray and iron accumulations in shades of red, brown, and yellow. Texture is clay loam, sandy clay loam, or sandy loam.

The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It has common to many iron accumulations in shades of red, brown, and yellow. The texture is commonly sandy loam, sandy clay loam, or clay loam, but it ranges to sandy clay in the lower part.

Macon Series

The Macon series consists of very deep, well drained soils on stream terraces and toe slopes in the northwestern part of the county. These soils formed in loamy sediments. Slopes range from 1 to 5 percent.

Soils of the Macon series are fine-loamy, mixed, thermic Typic Paleudalfs.

Macon soils are commonly associated on the landscape with Congaree, Leeper, Oktibbeha, Searcy, and Sumter soils. The moderately well drained Congaree and somewhat poorly drained Leeper soils are on adjacent flood plains. They are subject to frequent flooding. Oktibbeha, Searcy, and Sumter soils are on adjacent side slopes. Oktibbeha soils have vertic properties. Searcy soils have a clayey argillic horizon. Sumter soils are moderately deep over bedrock.

Typical pedon of Macon fine sandy loam, 1 to 5 percent slopes, about 11 miles northwest of Greenville, 2,800 feet east and 2,900 feet south of the northwest corner of sec. 16, T. 11 N., R. 13 E.

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; many fine and very fine roots; strongly acid; abrupt smooth boundary.

E—6 to 13 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine subangular blocky structure; friable;

few fine and very fine roots; strongly acid; clear smooth boundary.

Bt1—13 to 21 inches; yellowish red (5YR 5/6) clay loam; weak medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of some peds; strongly acid; clear wavy boundary.

Bt2—21 to 31 inches; yellowish red (5YR 4/6) clay loam; moderate medium subangular blocky structure; firm; few faint clay films on faces of most peds; few fine and medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) masses of iron accumulation; strongly acid; gradual wavy boundary.

Bt3—31 to 38 inches; red (2.5YR 4/6) clay loam; weak medium subangular blocky structure; firm; few faint clay films on faces of peds; common fine and medium distinct yellowish brown (10YR 5/6) and few fine distinct dark red (10R 3/6) masses of iron accumulation; moderately acid; gradual wavy boundary.

Bt4—38 to 72 inches; strong brown (7.5YR 5/6) clay loam; weak coarse subangular blocky structure; firm; few faint clay films on faces of some peds; many fine and medium distinct dark red (10R 3/6) and yellowish red (5YR 5/6) masses of iron accumulation; few fine distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) iron depletions; moderately acid.

The thickness of the solum is more than 60 inches. Reaction ranges from very strongly acid to moderately acid throughout the profile, except for the surface layer in areas that have been limed.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4.

The E horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. Texture is fine sandy loam or sandy loam.

The upper part of the Bt horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 6. Texture is loam, clay loam, or sandy clay loam. Some pedons have few to common iron accumulations in shades of red or brown.

The lower part of the Bt horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It has few to many iron accumulations in shades of red or brown and iron depletions in shades of gray. Texture is clay loam, sandy clay loam, sandy clay, or clay.

Malbis Series

The Malbis series consists of very deep, well drained soils on broad ridgetops and on side slopes of the uplands (fig. 17). These soils formed in loamy sediments. Slopes range from 1 to 8 percent.

Soils of the Malbis series are fine-loamy, siliceous, thermic Plinthic Paleudults.

Malbis soils are commonly associated on the landscape with Benndale, Orangeburg, and Smithdale soils. Benndale soils are in landscape positions similar to those of the Malbis soils. They are coarse-loamy, and they do not have plinthic features. Smithdale soils are on the lower slopes. They do not have plinthic features, and they have a reddish subsoil. Orangeburg soils are in slightly higher landscape positions. They do not have plinthic features, and they have a reddish subsoil.

Typical pedon of Malbis fine sandy loam, 1 to 3 percent slopes, about 2 miles east of Georgiana, 3,000 feet west and 1,320 feet north of the southeast corner of sec. 19, T. 8 N., R. 14 E.

Ap1—0 to 6 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

Ap2—6 to 9 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

Bt1—9 to 22 inches; yellowish brown (10YR 5/8) sandy clay loam; weak coarse subangular blocky structure; friable; few faint clay films on faces of some peds; few fine nodules of ironstone; very strongly acid; clear wavy boundary.

Bt2—22 to 34 inches; yellowish brown (10YR 5/8) sandy clay loam; weak coarse subangular blocky structure; friable; few faint clay films on faces of some peds; few fine streaks of uncoated sand; about 2 percent nodular plinthite; few fine nodules of ironstone; few fine distinct yellowish red (5YR 4/6) and strong brown (7.5YR 4/6) masses of iron accumulation; very strongly acid; clear wavy boundary.

Btv1—34 to 40 inches; brownish yellow (10YR 6/8) sandy clay loam; weak coarse subangular blocky structure; friable; few distinct yellowish brown (10YR 5/8) clay films on faces of some peds; about 5 percent nodular plinthite; few fine nodules of ironstone; few fine quartz pebbles; common fine distinct yellowish red (5YR 5/8) and common medium distinct strong brown (7.5YR 4/6) masses of iron accumulation; very strongly acid; clear wavy boundary.

Btv2—40 to 47 inches; brownish yellow (10YR 6/8) sandy clay loam; weak coarse subangular blocky structure; friable, slightly brittle; few distinct yellowish brown (10YR 5/6) clay films on faces of some peds; about 8 percent nodular plinthite; few fine nodules of ironstone; few fine quartz pebbles; common fine prominent red (2.5YR 4/8) and common medium prominent yellowish red (5YR 5/8) masses of iron accumulation; very strongly acid; clear wavy boundary.

Btv3—47 to 58 inches; brownish yellow (10YR 6/8) sandy clay loam; weak coarse subangular blocky structure; friable, slightly brittle; few distinct strong brown (7.5YR 5/6) clay films on faces of some peds; about 15 percent nodular plinthite; few fine nodules of ironstone; few fine quartz pebbles; common fine and medium prominent red (2.5YR 4/6) and common fine distinct light yellowish brown (10YR 6/4) masses of iron accumulation; very strongly acid; clear wavy boundary.

Btv4—58 to 72 inches; 35 percent yellowish brown (10YR 5/8), 35 percent red (2.5YR 4/6), and 30 percent light brownish gray (10YR 6/2) sandy clay loam; weak coarse subangular blocky structure; friable, slightly brittle; few faint clay films on faces of some peds; about 5 percent nodular plinthite; few fine prominent dark red (10R 4/8) masses of iron accumulation; very strongly acid.

The thickness of the solum is more than 60 inches. The depth to a horizon that has 5 percent or more plinthite ranges from 24 to 48 inches. Reaction ranges from very strongly acid to strongly acid throughout the profile, except for the surface layer in areas that have been limed.

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

The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8. Texture is loam, sandy clay loam, or clay loam.

The upper part of the Btv horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. It has few to many iron accumulations in shades of brown, yellow, or red.

The lower part of the Btv horizon, below a depth of 40 inches, has colors that are similar to the upper part of the Btv horizon, or it may not have a dominant matrix color and is multicolored in shades of brown, red, yellow, and gray. Texture is sandy clay loam or clay loam.

Mantachie Series

The Mantachie series consists of very deep, somewhat poorly drained soils on the flood plains of streams. These soils formed in loamy alluvium. Mantachie soils are subject to flooding for brief periods one or more times in most years. Slopes range from 0 to 1 percent.

Soils of the Mantachie series are fine-loamy, siliceous, acid, thermic Aeric Fluvaquents.

Mantachie soils are commonly associated with Bethera, Bibb, Bigbee, Cahaba, Eunola, and Iuka soils. The poorly drained Bethera soils are in slightly higher landscape positions and have a clayey argillic horizon. The poorly drained Bibb soils are in slightly lower, more concave positions on flood plains. They are coarse-loamy. The excessively drained Bigbee soils, the well drained Cahaba soils, and the moderately well drained Eunola soils are on adjacent terraces. The moderately well drained Iuka soils are in slightly higher, more convex positions on flood plains. They are coarse-loamy.

Typical pedon of Mantachie loam, in an area of Mantachie, Bibb, and Iuka soils, 0 to 1 percent slopes, frequently flooded; about 9 miles northeast of Greenville, 1,550 feet east and 700 feet south of the northwest corner of sec. 30, T. 11 N., R. 16 E.

A—0 to 3 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; friable; many fine and medium roots; few fine flakes of mica; strongly acid; clear smooth boundary.

Bw1—3 to 10 inches; dark yellowish brown (10YR 4/4) loam; weak coarse subangular blocky structure; friable; few fine roots; few fine flakes of mica; common medium distinct brown (10YR 5/3) and grayish brown (10YR 5/2) iron depletions; very strongly acid; clear wavy boundary.

Bw2—10 to 20 inches; 35 percent brown (10YR 4/3), 35 percent light brownish gray (10YR 6/2), and 30 percent yellowish brown (10YR 5/4) loam; weak coarse subangular blocky structure; friable; few fine roots; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bg1—20 to 32 inches; gray (10YR 6/1) loam; weak medium subangular blocky structure; friable; few fine roots; few fine flakes of mica; common medium distinct pale brown (10YR 6/3) and few fine faint light brownish gray (10YR 6/2) iron depletions; common medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bg2—32 to 49 inches; gray (10YR 6/1) clay loam; weak coarse subangular blocky structure; friable; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bg3—49 to 60 inches; gray (10YR 6/1) clay loam; weak coarse subangular blocky structure; friable; common medium distinct brownish yellow (10YR 6/6) masses of iron accumulation; common medium faint grayish brown (10YR 5/2) iron depletions; very strongly acid.

The thickness of the solum ranges from 30 to 65 inches. Reaction is very strongly acid or strongly acid throughout the profile, except for the surface layer in areas where lime has been added.

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

The Bw horizon has hue of 10YR or 2.5Y, value of 4 or 5, chroma of 3 to 6, and few to many iron depletions in shades of gray and iron accumulations in shades of yellow or brown; or it has no dominant matrix color and is multicolored in shades of gray, brown, and yellow. Texture is loam, clay loam, or sandy clay loam.

The Bg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It has few to many iron accumulations in shades of red, yellow, or brown. Texture is clay loam, loam, or sandy clay loam.

Oktibbeha Series

The Oktibbeha series consists of very deep, moderately well drained soils on uplands in the northwestern part of the county. These soils formed in layers of acid clay overlying alkaline clay or soft limestone. Slopes range from 5 to 10 percent.

Soils of the Oktibbeha series are very-fine, montmorillonitic, thermic Chromic Dystruderts.

Oktibbeha soils are commonly associated on the landscape with Brantley, Macon, Searcy, Sumter, and Watsonia soils. Brantley and Searcy soils are in higher landscape positions. They do not have vertic properties. Macon soils are in lower positions, and they are loamy throughout the profile. Sumter soils are in lower landscape positions. They are moderately deep over bedrock. Watsonia soils are in slightly higher positions, and they are shallow over bedrock.

Typical pedon of Oktibbeha clay loam, 5 to 10 percent slopes, eroded, about 16 miles northwest of Greenville, about 600 feet south and 500 feet east of the northwest corner of sec. 17, T. 11 N., R. 12 E.

Ap—0 to 4 inches; dark brown (7.5YR 4/2) clay; moderate coarse granular structure; firm; many fine roots; moderately acid; abrupt smooth boundary.

Bt1—4 to 12 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; very firm; few faint clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2—12 to 26 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure parting to strong fine subangular blocky and angular blocky; very firm; few faint clay films on faces of peds; few fine distinct light gray (10YR 6/1) iron depletions; common fine distinct brownish yellow (10YR 6/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btss—26 to 40 inches; yellowish red (5YR 5/6) clay; strong coarse angular blocky structure parting to strong fine and medium angular blocky; very firm; common pressure faces on peds; common large slickensides with grooved and polished surfaces; common medium distinct brownish yellow (10YR 6/6) masses of iron accumulation; few medium distinct gray (10YR 6/1) iron depletions; moderately acid; clear wavy boundary.

2C—40 to 60 inches; yellowish brown (10YR 5/6) clay; weak thick platy rock structure; firm; many soft masses of calcium carbonate; many medium distinct pale brown (10YR 6/3) iron depletions; strongly effervescent; moderately alkaline.

The thickness of the solum over alkaline clay or soft limestone ranges from 40 to more than 60 inches. The Ap and Bt horizons range from very strongly acid to moderately acid. The 2C horizon ranges from neutral to moderately alkaline.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 to 8. It has few to common iron accumulations in shades of brown and iron depletions in shades of gray. The texture is clay.

The Btss horizon has colors similar to those of the Bt horizon, but it also includes hue of 7.5YR and 10YR, value of 5 or 6, and chroma of 4 to 8. It has few to many iron accumulations in shades of brown and iron depletions in shades of gray. In some pedons, the horizon does not have a dominant matrix color and is multicolored in shades of brown, red, and gray. Texture is clay.

The 2C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8. It has few to many soft masses or nodules of calcium carbonate. Texture is clay or silty clay.

Orangeburg Series

The Orangeburg series consists of very deep, well drained soils on broad ridgetops and on side slopes of the uplands. These soils formed in loamy sediments. Slopes range from 0 to 8 percent.

Soils of the Orangeburg series are fine-loamy, siliceous, thermic Typic Kandiudults.

Orangeburg soils are commonly associated on the landscape with Greenville, Lucedale, Lucy, Luverne, Malbis, Smithdale, and Troup soils. Greenville, Lucedale, and Lucy soils are in landscape positions similar to those of the Orangeburg soils. Greenville soils have a dark red, clayey argillic horizon. Lucedale soils have a dark red argillic horizon. Lucy soils have a thick, sandy epipedon. Troup soils are generally in lower positions and have a thick, sandy epipedon. Luverne and Smithdale soils are in lower positions on the landscape. Luverne soils have a clayey argillic horizon. Smithdale soils have an argillic horizon that decreases in clay content by 20 percent or more within a depth of 60 inches. Malbis soils are in landscape positions similar to those of the Orangeburg soils but are at slightly lower elevations. They have a brownish subsoil and plinthic features.

Typical pedon of Orangeburg sandy loam, 1 to 5 percent slopes, about 4 miles west of McKenzie, 2,350 feet west and 1,320 feet north of the southeast corner of sec. 29, T. 7 N., R. 13 E.

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

Ap2—6 to 13 inches; yellowish brown (10YR 5/4) sandy loam; weak coarse subangular blocky structure; firm; common fine and very fine roots; strongly acid; abrupt smooth boundary.

Bt1—13 to 16 inches; yellowish red (5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of some peds; very strongly acid; gradual wavy boundary.

Bt2—16 to 21 inches; red (2.5YR 4/8) sandy clay loam; weak coarse subangular blocky structure; friable; few fine roots; few faint clay films on faces of most peds; very strongly acid; gradual wavy boundary.

Bt3—21 to 34 inches; red (2.5YR 4/6) sandy clay loam; weak coarse subangular blocky structure; firm; many fine roots; few faint clay films on faces of some peds; very strongly acid; gradual wavy boundary.

Bt4—34 to 52 inches; red (2.5YR 4/6) sandy clay loam; weak coarse subangular blocky structure; friable; few faint clay films on faces of some peds; very strongly acid; gradual wavy boundary.

Bt5—52 to 75 inches; red (2.5YR 4/8) sandy clay loam; weak coarse subangular blocky structure; friable; few fine roots; few faint clay films on faces of some peds; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is very strongly acid or moderately acid throughout the profile, except for the surface layer in areas where lime has been added.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4.

The E horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. It is loamy sand or sandy loam.

The 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 or sandy loam.

Rains Series

The Rains series consists of very deep, poorly drained soils on low stream terraces and in slight depressions on uplands. These soils formed in loamy sediments. Slopes range from 0 to 2 percent.

Soils of the Rains series are fine-loamy, siliceous, thermic Typic Paleaquults.

Rains soils are commonly associated on the landscape with Bethera, Greenville, Lucedale, Lynchburg, and Orangeburg soils. Bethera soils are in slightly lower positions on terraces, and they have a clayey argillic horizon. The well drained Greenville, Lucedale, and Orangeburg soils are in slightly higher, more convex positions on uplands. The somewhat poorly drained Lynchburg soils are in slightly higher positions on the landscape.

Typical pedon of Rains sandy loam, in an area of Rains-Bethera complex, 0 to 1 percent slopes, occasionally flooded; about 1.5 miles east of Georgiana, 600 feet east and 700 feet south of the northwest corner of sec. 25, T. 8 N., R. 13 E.

A—0 to 7 inches; dark gray (10YR 4/1) sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

Eg—7 to 11 inches; light brownish gray (10YR 6/2) sandy loam; weak coarse subangular blocky structure; very friable; many fine roots; common medium distinct yellowish brown (10YR 5/6) and light yellowish brown (10YR 6/4) masses of iron accumulation; extremely acid; clear smooth boundary.

Btg1—11 to 18 inches; gray (10YR 6/1) sandy clay loam; moderate medium subangular blocky structure; friable; common fine roots; few faint clay films on faces of some peds; common medium distinct yellowish brown (10YR 5/6) and common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation; extremely acid; clear wavy boundary.

Btg2—18 to 25 inches; grayish brown (2.5Y 5/2) sandy clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of some peds; many medium distinct yellowish brown (10YR 5/6) and few medium prominent red (2.5YR 4/6) masses of iron accumulation; extremely acid; gradual wavy boundary.

Btg3—25 to 55 inches; gray (10YR 6/1) sandy clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of some peds; common medium prominent yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), and red (2.5YR 4/6) masses of iron accumulation; extremely acid; gradual wavy boundary.

Btg4—55 to 72 inches; gray (10YR 6/1) clay loam; weak coarse subangular blocky structure; friable; few faint clay films on faces of peds; many medium prominent yellowish brown (10YR 5/6) and brownish yellow (10YR 6/8) masses of iron accumulation; extremely acid.

The thickness of the solum is more than 60 inches. Reaction ranges from extremely acid to strongly acid throughout the profile, except for the surface layer in areas where lime has been applied.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2. Texture is sandy loam or fine sandy loam.

The E horizon or Eg horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. Texture is sandy loam or fine sandy loam.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It has few to many iron accumulations in shades of brown, yellow, and red. Texture is commonly sandy clay loam or clay loam, but it ranges to loam in the upper part and to sandy clay in the lower part.

Searcy Series

The Searcy series consists of very deep, moderately well drained soils on uplands in the northwestern part of the county. These soils formed in thick layers of clayey sediments. Slopes range from 2 to 15 percent.

Soils of the Searcy series are fine, mixed, thermic Aquic Paleudalfs.

Searcy series are commonly associated on the landscape with Brantley, Demopolis, Leeper, Macon, Oktibbeha, and Sumter soils. The well drained Brantley soils are in higher positions on the landscape than the Searcy soils. Demopolis soils are in higher positions and are shallow over bedrock. The somewhat poorly drained Leeper soils are on flood plains. Macon soils are in lower positions, and they have a loamy argillic horizon. Oktibbeha and Sumter soils are in the higher landscape positions. Oktibbeha soils have vertic properties. Sumter soils are moderately deep over bedrock. They are alkaline throughout the profile.

Typical pedon of Searcy sandy clay loam, 2 to 8 percent slopes, eroded, about 4.5 miles north of Fort Dale, 2,100 feet east and 2,200 feet south of the northwest corner of sec. 4, T. 11 N., R. 14 E.

Ap—0 to 3 inches; brown (7.5YR 4/4) sandy clay loam; weak medium subangular blocky structure; friable; many fine and very fine roots; strongly acid; clear smooth boundary.

Bt1—3 to 8 inches; yellowish red (5YR 4/6) clay loam; moderate medium subangular blocky structure parting to strong fine subangular blocky; firm; common fine and medium roots and few coarse roots; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt2—8 to 18 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure parting to strong fine subangular blocky; firm; common fine, medium, and coarse roots; few faint clay films on faces of peds; common very fine flakes of mica; common medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) masses of iron accumulation; few fine distinct grayish brown (10YR 5/2) iron depletions; strongly acid; clear wavy boundary.

Bt3—18 to 31 inches; 35 percent red (2.5YR 4/6), 35 percent light brownish gray (10YR 6/2), and 30 percent yellowish brown (10YR 5/6) clay; moderate medium subangular blocky structure parting to strong fine subangular blocky; firm; common fine and medium roots and few coarse roots; common distinct clay films on faces of peds; common very fine flakes of mica; areas of red and yellowish brown are masses of iron accumulation and areas of light brownish gray are iron depletions; strongly acid; clear wavy boundary.

Bt4—31 to 37 inches; 40 percent light brownish gray (10YR 6/2), 30 percent red (2.5YR 4/6), and 30 percent strong brown (7.5YR 5/6) clay; moderate medium subangular blocky structure parting to moderate fine subangular blocky; firm; few fine and medium roots; common distinct clay films on faces of peds; many very fine flakes of mica; areas of light brownish gray are iron depletions and areas of red and strong brown are masses of iron accumulation; strongly acid; clear wavy boundary.

2Bt5—37 to 55 inches; 40 percent strong brown (7.5YR 5/6), 30 percent yellowish brown (10YR 5/6), and 30 percent light brownish gray (10YR 6/2) clay; moderate coarse subangular blocky structure; firm; few fine roots; distinct continuous clay films on faces of peds; common very fine flakes of mica; areas of strong brown and yellowish brown are masses of iron accumulation and areas of light brownish gray are iron depletions; very strongly acid; clear wavy boundary.

2Bt6—55 to 65 inches; 50 percent yellowish brown (10YR 5/6) and 50 percent gray (5Y 6/1) clay; moderate coarse subangular blocky structure; firm; distinct continuous clay films on faces of peds; common very fine flakes of mica; areas of yellowish brown are masses of iron accumulation and areas of gray are iron depletions; extremely acid.

The thickness of the solum is more than 60 inches. Reaction ranges from extremely acid to moderately acid throughout the solum, except for the surface layer in areas where lime has been added.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4.

The upper part of the Bt horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 6. Texture is commonly clay or sandy clay, but some pedons have a thin layer of clay loam or sandy clay loam in the upper part.

The lower part of the Bt horizon has colors that are similar to those of the upper part, or it does not have a dominant matrix color and is multicolored in shades of red, brown, and gray. The texture is sandy clay, clay, or silty clay.

The 2Bt horizon, if it occurs, does not have a dominant matrix color and is multicolored in shades of brown, yellow, gray, and red. Texture is sandy clay, clay, or silty clay.

Smithdale Series

The Smithdale series consists of very deep, well drained soils on narrow ridgetops and on side slopes of the uplands. These soils formed in thick layers of loamy sediments. Slopes range from 8 to 35 percent.

Soils of the Smithdale series are fine-loamy, siliceous, thermic Typic Hapludults.

Smithdale soils are commonly associated on the landscape with Alaga, Greenville, Luverne, Malbis, Orangeburg, and Troup soils. Alaga, Luverne, and Troup soils are in landscape positions similar to those of the Smithdale soils. Alaga and Troup soils have a thick, sandy epipedon. Luverne soils have a clayey argillic horizon. Greenville, Malbis, and Orangeburg soils are generally in higher landscape positions than the Smithdale soils. Malbis soils have a brownish subsoil and plinthic features. Greenville soils have a dark red, clayey argillic horizon. Orangeburg soils have an argillic horizon that does not decrease in clay content with increasing depth.

Typical pedon of Smithdale sandy loam, 8 to 15 percent slopes, about 5.5 miles northeast of Greenville, 600 feet south and 1,320 feet west of the northeast corner of sec. 10, T. 10 N., R. 15 E.

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

BE—6 to 11 inches; yellowish red (5YR 4/6) sandy loam; weak fine granular structure; very friable; common fine roots; very strongly acid; clear wavy boundary.

Bt1—11 to 23 inches; red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; few faint clay films on faces of some peds; very strongly acid; gradual wavy boundary.

Bt2—23 to 41 inches; red (2.5YR 4/8) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of some peds; few fine fragments of ironstone; very strongly acid; clear wavy boundary.

Bt3—41 to 52 inches; red (2.5YR 4/6) sandy loam; weak medium subangular blocky structure; very friable; few faint clay films on faces of peds; few thin streaks of pale brown (10YR 6/3) sand; few fine fragments of ironstone; very strongly acid; gradual wavy boundary.

Bt4—52 to 72 inches; red (2.5YR 4/6) sandy loam; weak coarse subangular blocky structure; very friable; few faint clay films of faces of peds; few thin streaks of pale brown (10YR 6/3) sand; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is very strongly acid or strongly acid throughout the solum, except for the surface layer in areas where lime has been added.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 1 to 3.

The E horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 2 to 4. It is sandy loam or fine sandy loam.

Many pedons have a BE horizon that has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 8. Texture is fine sandy loam or sandy loam.

The upper part of the Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 to 8. Texture is loam, sandy clay loam, or clay loam. The lower part has colors similar to those of the upper part, except that it commonly has few to many streaks or pockets of uncoated sand. Texture is loam or sandy loam.

Sumter Series

The Sumter series consists of moderately deep, well drained soils on uplands in the northwestern part of the county. These soils formed in materials weathered from soft limestone (chalk). Slopes range from 5 to 15 percent.

Soils of the Sumter series are fine-silty, carbonatic, thermic Rendollic Eutrochrepts.

Sumter soils are commonly associated on the landscape with Brantley, Demopolis, Macon, Oktibbeha, Searcy, and Watsonia soils. The Brantley, Oktibbeha, and Searcy soils are in lower positions on the landscape than the Sumter soils. They have an acid, clayey argillic horizon. Demopolis and Watsonia soils are in higher positions on the landscape than the Sumter soils. They are shallow over bedrock.

Typical pedon of Sumter silty clay, 5 to 15 percent slopes, eroded, about 16 miles northwest of Greenville, 1,500 feet east and 2,200 feet south of the northwest corner of sec. 9, T. 11 N., R. 12 E.

Ap—0 to 3 inches; grayish brown (2.5Y 5/2) silty clay; moderate coarse granular structure; friable; many fine roots; common fine nodules of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk1—3 to 13 inches; light yellowish brown (2.5Y 6/4) silty clay; weak medium subangular blocky structure; firm; few fine roots; common fine nodules of calcium carbonate; violently effervescent; moderately alkaline; gradual wavy boundary.

Bk2—13 to 26 inches; light yellowish brown (2.5Y 6/4) silty clay; moderate medium subangular blocky structure; friable; common fine roots; many fine and medium nodules of calcium carbonate; common very fine black concretions of manganese oxide; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation; violently effervescent; moderately alkaline; abrupt wavy boundary.

BC—26 to 30 inches; light yellowish brown (2.5Y 6/4) silty clay loam; weak coarse subangular blocky structure; few fine roots; common fine and medium nodules of calcium carbonate; few fragments of soft limestone; common very fine black concretions of manganese oxide; common medium distinct yellowish brown (10YR

5/6) masses of iron accumulation; violently effervescent; moderately alkaline; abrupt wavy boundary.

Cr—30 to 60 inches; light olive brown (2.5Y 5/4) soft limestone (chalk); moderate thick platy rock structure; can be cut with hand tools and is rippable by light machinery; violently effervescent; moderately alkaline.

The thickness of the solum and the depth to soft limestone range from 20 to 40 inches. Reaction ranges from neutral to moderately alkaline in the Ap horizon and from slightly alkaline to moderately alkaline in the Bk and BC horizons.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2.

The upper part of the Bk horizon has hue of 10YR to 5Y, value of 5 or 6, and chroma of 4 to 6. Texture is silty clay loam, silty clay, or clay.

The lower part of the Bk horizon and the BC horizon have hue of 10YR to 5Y, value of 5 to 7, and chroma of 3 to 6. Texture is silty clay loam, silty clay, or clay.

The Cr horizon is soft limestone (chalk). It can be cut with difficulty with hand tools and is rippable by light machinery.

Troup Series

The Troup series consists of very deep, somewhat excessively drained soils on ridgetops and on side slopes of the uplands. These soils formed in sandy and loamy sediments. Slopes range from 0 to 35 percent.

Soils of the Troup series are loamy, siliceous, thermic Grossarenic Kandiudults.

Troup soils are commonly associated on the landscape with Alaga, Lucy, Luverne, Orangeburg, and Smithdale soils. Alaga and Lucy soils are in landscape positions similar to those of the Troup soils. Alaga soils do not have loamy horizons within a depth of 80 inches. Lucy soils have a sandy epipedon that ranges from 20 to 40 inches thick. Luverne and Smithdale soils are in positions on side slopes similar to those of the Troup soils. They do not have a thick, sandy epipedon. Orangeburg soils are in higher landscape positions, and they do not have a thick, sandy epipedon.

Typical pedon of Troup loamy sand, in an area of Troup-Alaga complex, 5 to 15 percent slopes; about 15 miles northwest of Greenville, 2,640 feet west and 2,300 feet south of the northeast corner of sec. 14, T. 11 N., R. 12 E.

Ap—0 to 8 inches; dark brown (7.5YR 4/4) loamy sand; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

E1—8 to 36 inches; yellowish red (5YR 4/6) loamy sand; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

E2—36 to 50 inches; yellowish red (5YR 4/8) loamy sand; single grained; loose; very strongly acid; abrupt wavy boundary.

Bt—50 to 66 inches; yellowish red (5YR 4/6) sandy loam; weak coarse subangular blocky structure; friable; few faint clay films on faces of peds; very strongly acid.

The thickness of the solum is more than 80 inches. Reaction is very strongly acid or strongly acid throughout the profile, except in areas where lime has been added.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4.

The E horizon has hue of 5YR to 10YR, value of 4 to 8, and chroma of 3 to 8. Texture is loamy sand, loamy fine sand, or sand.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 4 to 8. Texture is sandy loam, fine sandy loam, or sandy clay loam.

Watsonia Series

The Watsonia series consists of shallow, well drained soils on uplands in the northwestern part of the county. These soils formed in clayey sediments overlying soft limestone. Slopes range from 5 to 15 percent.

Soils of the Watsonia series are clayey, montmorillonitic, thermic Leptic Hapluderts.

Watsonia soils are commonly associated on the landscape with Brantley, Demopolis, Oktibbeha, and Sumter soils. Brantley and Oktibbeha soils are in lower positions on side slopes. They are very deep over bedrock. Demopolis soils are in landscape positions similar to those of the Watsonia soils. They are loamy, and they are alkaline to the surface. Sumter soils are in higher landscape positions, and they are moderately deep over bedrock.

Typical pedon of Watsonia clay, in an area of Demopolis-Watsonia complex, 2 to 8 percent slopes; about 4.5 miles northwest of Fort Dale, 900 feet east and 1,800 feet north of the southwest corner of sec. 7, T. 11 N., R. 14 E.

A—0 to 4 inches; brown (10YR 4/3) clay; moderate medium subangular blocky structure; firm; few fine and medium roots; slightly acid; clear wavy boundary.

Bss1—4 to 10 inches; yellowish red (5YR 5/6) clay; weak medium subangular blocky and angular blocky structure; firm; few fine roots; common pressure faces; few slickensides with slightly grooved surfaces; moderately acid; clear wavy boundary.

Bss2—10 to 16 inches; yellowish brown (10YR 5/8) clay; moderate coarse angular blocky structure; firm; few fine and very fine roots; common slickensides with distinct polished and grooved surfaces; slightly acid; clear wavy boundary.

Bkss—16 to 19 inches; light olive brown (2.5Y 5/3) clay; moderate coarse angular blocky structure; firm; common slickensides with distinct polished and grooved surfaces; common soft masses of calcium carbonate; strongly effervescent; moderately alkaline; abrupt irregular boundary.

2Cr—19 to 60 inches; pale yellow (5Y 8/3) soft limestone (chalk); weak medium and thick platy rock structure; can be cut with hand tools and is rippable by light machinery; violently effervescent; moderately alkaline.

The thickness of the solum and the depth to bedrock is 10 to 20 inches.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 4. Reaction ranges from very strongly acid to slightly acid.

The upper part of the Bss horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8; or it has no dominant matrix color and is multicolored in shades of red, brown, and olive. Reaction ranges from very strongly acid to slightly acid.

The lower part of the Bss horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 4 to 8. Reaction ranges from slightly acid to moderately alkaline. Some pedons have few to common soft masses or nodules of calcium carbonate. Texture is clay or silty clay.

The 2Cr horizon is soft limestone (chalk). It can be cut with difficulty with hand tools and is rippable by light machinery.

Formation of the Soils

In this section, the factors of soil formation are related to the soils in Butler County and the processes of horizon differentiation are explained.

Factors of Soil Formation

Soil is a natural, three-dimensional body on the earth's surface that supports plants. It forms through weathering and other processes that act on deposited or accumulated geologic material. The kind of soil that forms depends on the type of parent material; the climate under which soil material has existed since accumulation; the relief, or lay of the land; the plant and animal life in and on the soil; and the length of time that the forces of soil formation have acted on the soil material. The relative importance of each of these factors differs from place to place; in some areas, one factor is more important, and in other areas another may dominate. A modification or variation in any of the factors results in a different kind of soil.

Climate and living organisms are the active factors of soil formation. They act on parent material and change it to a natural body with definite characteristics. The effects of climate and living organisms are conditioned by relief, which influences surface drainage, the amount of water that percolates through the soil, the rate of erosion, and the kind of vegetation that grows on the soil. The nature of the parent material also affects the kind of soil profile that is formed. Time is needed for the parent material to change into a soil. The development of a distinct soil horizon normally requires a long period of time.

Parent Material

The soils of Butler County formed mainly in two kinds of material—marine sediments that have undergone considerable weathering in place and water-deposited material on stream terraces and flood plains. Arundel, Halso, Luverne, Orangeburg, and Troup soils formed in weathered marine sediment. Bethera, Bibb, Bonneau, Cahaba, Eunola, and Iuka soils formed in the water-deposited material on stream terraces and flood plains.

Climate

The climate of Butler County is warm and humid. Summers are long and hot. Winters are short and mild, and the ground rarely freezes to a depth of more than a few inches. The climate is fairly even throughout the county and accounts for few differences among the soils. Rainfall averages 56 inches a year.

This mild, humid climate favors rapid decomposition of organic matter and increases the rate of chemical reactions in the soil. The plentiful rainfall leaches large amounts of soluble bases and carries the less soluble fine particles downward, resulting in acid and sandy soils that are low in natural fertility. The large amount of moisture and the warm temperature favor the growth of bacteria and fungi and speed the decomposition of organic matter, resulting in soils that are low in organic matter content.

Relief

Relief influences the formation of soil through its effect on drainage, runoff, and erosion. In Butler County, the topography ranges from nearly level to steep. The elevation ranges from 170 to 570 feet above sea level. Large, flat areas and depressions generally are poorly drained, and accumulated water, received mainly as runoff from adjacent areas, slows the formation of soils. As the slope increases, the hazard of erosion and the runoff rate increase and the rate of leaching decreases. In places, the rate of erosion nearly keeps pace with the rate of soil formation. Thus, the soils in steeply sloping areas are generally thin and weakly developed.

The aspect of the slope affects the microclimate. Soils on south- or southwest-facing slopes warm up somewhat earlier in spring and generally reach a higher temperature each day than soils on north-facing slopes. The warmer soil temperature results in accelerated chemical weathering. The soils on north-facing slopes retain moisture longer because they are in shade for longer periods and the temperature is lower. In Butler County, differences caused by the direction of slope are slight and are of minor importance in the formation of soils.

Plants and Animals

Living organisms greatly influence the processes of soil formation and the characteristics of the soils. Trees, grasses, earthworms, rodents, fungi, bacteria, and other forms of plant and animal life are affected by the other soil-forming factors. Animal activity is largely confined to the surface layer of the soil. The soil is continually mixed by their activity, which improves water infiltration. Plant roots create channels through which air and water move more rapidly, thereby improving soil structure and increasing the rate of chemical reactions in the soil.

Microorganisms are important in the decomposition of organic matter, which releases plant nutrients and chemicals into the soil. These nutrients are either used by the plants or are leached from the soil. Human activities have a strong influence on plant and animal populations in the soil and thus affect the future rate of soil formation.

The native vegetation in the uplands of Butler County consisted dominantly of coniferous and deciduous trees. The understory plants were poison ivy, blackberry, southern waxmyrtle, panicums, bluestems, American beautyberry, indiangrass, longleaf uniola, and dogwood. These plants represent only a very limited number of species that once grew in this county. They can be used as a guide to the plants that presently grow in the county.

The plant communities in the area are also reflected in the species distribution of fauna. Animals, in turn, have an impact on the soil properties of a particular area. For example, worms, moles, armadillo, and gophers can improve aeration in a compacted soil. Microbes that thrive in a particular plant community will react to various soil conditions and consequently influence the soil profile by providing decayed organic matter and nitrogen to the soil matrix.

Time

If all other factors of soil formation are equal, the degree of soil formation is in direct proportion to time. If soil-forming factors have been active for a long time, horizon development is stronger than if these same factors have been active for a relatively short time.

Geologically, the soils in Butler County are relatively young. The youngest soils are the alluvial soils on active flood plains of streams and rivers. These soils receive deposits of sediment and are undergoing a cumulative soil-forming process. In most cases, these young soils have very weakly defined horizons, mainly because the soil-forming processes have only been active for a short time.

Soils on terraces of major streams and rivers are older than soils on flood plains but are still relatively young. Although they formed in material deposited by the streams, the stream or river channel is now deeper and overflow no longer reaches the soils. Many of these soils have relatively strong horizon development.

The oldest soils in the county are in the uplands. They formed in marine sediments that have undergone considerable weathering. Most of these soils have strong horizon development.

Processes of Horizon Differentiation

The processes involved in the formation of soil horizons are accumulation of organic matter, leaching of calcium carbonate and bases, reduction and transfer of iron, and formation and translocation of silicate clay minerals. These processes can occur in combination or individually, depending on the integration of the factors of soil formation.

Most soils have four main horizons. The A horizon is the surface layer. It is the horizon of maximum accumulation of organic matter. The E horizon, usually called the subsurface layer, is the horizon of maximum loss of soluble or suspended material. Lucy soils have an A horizon and an E horizon. Other soils, such as Iuka soils, have an A horizon but do not have an E horizon. Organic matter has accumulated in the surface layer of all soils in Butler County to form an A horizon. The content of organic matter varies in different soils because of differences in relief, wetness, and natural fertility.

The B horizon, usually called the subsoil, lies immediately below the A or E horizon. It is the horizon of maximum accumulation of dissolved or suspended material, such as iron or clay. The B horizon has not yet developed in very young soils, such as Bibb soils.

The C horizon is the substratum. It has been affected very little by soil-forming processes, but it may be somewhat modified by weathering.

The chemical reduction and transfer of iron, called gleying, is evident in the wet soils of the county. Gleying results in gray colors that indicate the reduction and loss of iron and manganese. The horizons of some soils, such as in the Malbis soils, have reddish-brown mottles, which indicate a segregation of iron.

Leaching of carbonates and bases has occurred in most of the soils in the county. This process contributes to the development of distinct horizons and to the naturally low fertility and acid reaction of some soils. Soils such as Demopolis and Sumter soils formed in material weathered from chalk or soft limestone, and they maintain a high content of bases and an alkaline reaction.

In uniform materials, natural drainage generally is closely associated with slope or relief. It generally affects the color of the soil. Soils that formed under good drainage conditions, such as Orangeburg soils, have a subsoil that is uniformly bright in color. Soils that formed under poor drainage conditions, such as Bibb and Rains soils, have a grayish color. Soils that formed where drainage is intermediate have a subsoil that is mottled in shades of gray and brown. Mantachie and Lynchburg soils are examples. The grayish color persists even after artificial drainage is provided.

In steep areas, the surface soil erodes. In low areas or in depressions, soil materials often accumulate and add to the thickness of the surface layer. In some areas, the formation of soil materials and the rates of removal are in equilibrium with soil development. The degree of relief is also related to the eluviation of clay from the E horizon to the Bt horizon.

Surface Geology

Geologically, the soils in Butler County are relatively young. However, when the degree of soil development is considered, the soils range in age from old to very young. The mature soils in the uplands formed in marine sediments that have undergone considerable weathering. Many of these soils have relatively strong horizon development and have thus reached equilibrium with the environment. The youngest soils developed in alluvium on active flood plains along streams. They are subject to frequent flooding and receive additional sediment from each flood. They have not developed well-defined horizons and retain the characteristics of the parent material.

The geologic formations in the county are sedimentary. They range in age from Cretaceous to Recent. These formations consist mainly of unconsolidated sediments of sand, silt, clay, and gravel and layers of shale, claystone, and limestone. The geologic units in the county, listed from the oldest to the youngest, include the Ripley and Providence Sand Formations (Selma Group), which are of Cretaceous age; the Clayton, Naheola, and Porters Creek Formations, undifferentiated (Midway Group); the Nanafalia, Tuscahoma Sand, and Hatchetigbee Formations (Wilcox Group); the Tallahatta and Lisbon Formations (Claiborne Group); residuum, which is of Tertiary age; and alluvial and terrace deposits, which are of Quaternary age *(14, 24)*.

The Ripley Formation is the oldest geologic unit exposed in Butler County. It is 250 to 270 feet thick and dominantly consists of gray calcareous sand, sandstone, and sandy glauconitic limestone. The soils that formed in this material include Alaga, Luverne, Smithdale, and Troup soils.

The Providence Sand overlies the Ripley Formation. It is exposed in the northeastern part of the county. It is 40 to 60 feet thick and consists of dark gray to yellowish gray, thinly bedded, carbonaceous, micaceous clay and light reddish brown, very fine-grained to fine-grained, micaceous sand and silt. The soils that formed in this material include Luverne, Orangeburg, and Smithdale soils.

The Clayton Formation overlies the Providence Sand in the northwestern part of the county. It is 120 to 170 feet thick. It consists of greenish gray and brownish red sand; yellowish brown sandstone; dark gray and olive gray silt and clay; and light gray, fossiliferous limestone or chalk. Demopolis, Oktibbeha, Searcy, Sumter, and Watsonia soils developed in this material.

The Naheola and Porters Creek Formations, undifferentiated, overlie the Clayton Formation. They are in a northwest- to southeast-trending belt across the northern part of the county. The combined thickness of the Naheola and Porters Creek Formations is 120 to 270 feet. These formations consist of black and light brown, glauconitic and carbonaceous sandy clay; reddish brown fossiliferous clay; reddish purple, micaceous, clayey sand and silt; and greenish gray glauconitic sand. The soils that formed in this material include Alaga, Greenville, Malbis, and Troup soils.

The Nanafalia Formation overlies the Naheola and Porters Creek Formations and is exposed in the central part of the county. It is 140 to 220 feet thick. It consists of orange to greenish gray sand and sandstone and gray claystone. The soils that formed in this material include Halso and Luverne soils.

The Tuscahoma Sand overlies the Nanafalia Formation and is exposed in a 10 to 12 mile-wide belt in the southern part of the county. It is 220 to 350 feet thick. It consists of thinly bedded, olive gray and light gray, sandy and silty, carbonaceous clay and reddish brown, pink, and greenish gray, very fine-grained to coarse-grained, thinly bedded to massive, fossiliferous sand. The soils that formed in this material include Halso and Luverne soils.

The Hatchetigbee Formation overlies the Tuscahoma Sand and is exposed in the southern part of the county. It is 5 to 55 feet thick. It consists of greenish gray, fine-grained, fossiliferous sand; olive gray clay; and yellowish gray, fine-grained sand. The soils that formed in this material include Halso and Luverne soils.

The Tallahatta Formation overlies the Hatchetigbee Formation and is exposed in the southern part of the county. It is 80 to 120 feet thick. It consists of light gray clay and claystone (buhrstone); light green to greenish gray, fine- to medium-grained glauconitic sand; and light gray to yellowish gray sandstone. Arundel soils are the most common type of soils that formed in this material.

The Lisbon Formation overlies the Tallahatta Formation and is exposed in the southern part of the county. It is 40 to 80 feet thick. The soils that formed in this material include Alaga, Greenville, Lucy, Orangeburg, and Troup soils.

Residuum includes greatly disarranged and deeply weathered deposits that unconformably overlie the Lisbon Formation. It is not, in the strictest sense, a geologic formation, but it is a mappable geologic unit. It is 5 to 30 feet thick. It consists of light gray and reddish gray sandy clay; yellowish brown and dark red, fine-grained to coarse-grained sand; and light grayish brown, fossiliferous chert boulders. The soils that formed in this material include Greenville, Lucedale, Malbis, and Orangeburg soils.

High terrace deposits overlie the older formations that are adjacent to valleys of the major streams. They range in thickness from 1 to 30 feet. They consist of poorly sorted deposits of reddish brown, yellowish red, and gray gravel, sand, silt, and clay. The soils that formed in this material include Benndale, Bonneau, Greenville, Lucedale, and Malbis soils.

Alluvial deposits of Recent age and low terrace deposits occur in stream valleys throughout the county. They overlie older geologic units and are generally 1 to 20 feet thick. They consist of deposits of yellowish gray and light gray sand, gravel, clay, and silt. Bibb, Congaree, Iuka, Leeper, and Mantachie soils are on active flood plains. Bethera, Cahaba, Eunola, and Rains soils are on low terraces.

References

(1) Alabama Department of Agriculture and Industries. 1984. Alabama agricultural statistics.

(2) Alabama Department of Economic and Community Affairs. 1984. Alabama county data book.

(3) American Association of State Highway and Transportation Officials. 1986. Standard specifications for highway materials and methods of sampling and testing. Ed. 14, 2 vol.

(4) American Society for Testing and Materials. 1993. Standard classification of soils for engineering purposes. ASTM Stand. D2487.

(5) Beck, Donald E. 1962. Yellow-popular site index curves. U.S. Dep. Agric., Forest Serv., Southeast. Forest Exp. Sta. Res. Note 180.

(6) Briscoe, C.B., and M.D. Ferrill. 1958. Height growth of American sycamore in southeastern Louisiana. La. St. Univ. Agr. Exp. Sta. Res. Rel., La. St. Univ. Forest. Note 19.

(7) Broadfoot, W.M., and R.M. Krinard. 1959. Guide for evaluating sweetgum sites. U.S. Dep. Agric., Forest Serv., South. Forest Exp. Sta. Occas. Pap. 176.

(8) Broadfoot, W.M. 1960. Field guide for evaluating cottonwood sites. U.S. Dep. Agric., Forest Serv., South. Forest Exp. Sta. Occas. Pap. 178.

(9) Broadfoot, W.M. 1960. Field guide for evaluating cherrybark oak sites. U.S. Dep. Agric., Forest Serv., South. Forest Exp. Sta. Occas. Pap. 190.

(10) Coile, T.S., and F.X. Schumacher. 1953. Site index for young stands of loblolly and shortleaf pines in the Piedmont Plateau Region. J. For. 51.

(11) Hajek, B.F., F. Adams, and J.T. Cope, Jr. 1972. Rapid determination of exchangeable bases, acidity, and base saturation for soil characterization. Soil Sci. Soc. Am. J., vol. 36.

(12) Johnson, William M. 1961. Transect methods for determination of composition of soil mapping units. Soil Surv. Tech. Notes, U.S. Dep. of Agric., Soil Conserv. Serv.

(13) Little, John B. 1885. History of Butler County, Alabama, 1815 to 1885. Reprinted in 1971 by John G. Little, Jr.

(14) Reed, Philip C. and J.G. Newton. 1967. Geology of Butler County, Alabama. Ala. Geol. Surv., Oil and Gas Board, Univ. of Alabama, map 65.

(15) Steers, C.A., and B.F. Hajek. 1979. Determination of map unit composition by a random selection of transects. Soil Sci. Soc. Am. J., vol. 43.

(16) United States Department of Agriculture. 1907. Soil survey of Butler County, Alabama. Bureau of Soils.

(17) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436.

(18) United States Department of Agriculture. 1976. Volume, yield, and stand tables for second growth southern pines. Forest Serv. Misc. Publ. 50.

(19) United States Department of Agriculture. 1982. Status and conditions of land and water resources in Alabama—1982. National Resources Inventory. Soil Conserv. Serv., Econ. Res. Serv., Forest Serv.

(20) United States Department of Agriculture. 1985. Forest statistics for Alabama counties in 1984. Forest Serv., South. Forest Exp. Sta., Resour. Bull. SO-97.

(21) United States Department of Agriculture. 1991. Soil survey laboratory methods manual. Soil Conserv. Serv., Soil Surv. Invest. Rep. 42.

(22) United States Department of Agriculture. 1993. Soil survey manual. U.S. Dep. Agric. Handb. 18.

(23) United States Department of Agriculture. 1994. Keys to soil taxonomy. 6th ed., Soil Surv. Staff.

(24) United States Department of the Interior, Water Resources Division, Bureau of Mines, and the Geological Survey and Oil and Gas Board of Alabama. 1967. Mineral and water resources, Butler County, Alabama. Geol. Surv. of Alabama, Info. Ser. 36, University of Alabama.

Glossary

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.

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

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

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

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

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

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

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

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

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

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

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

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

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

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.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

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 depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

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.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

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

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

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

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.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

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

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

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 wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

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

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

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.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

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 human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

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.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

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, or 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.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

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.

Gilgai. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

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

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.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

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

Ground water. Water filling all the unblocked pores of the material below the water table.

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.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

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

O horizon.—An organic layer of fresh and decaying plant residue.

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

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

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.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it 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 potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

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.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Knoll. A small, low, rounded hill rising above adjacent landforms.

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.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

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

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

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

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.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

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

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

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. 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 three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

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. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

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 affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as “saturated hydraulic conductivity,” which is defined in the “Soil Survey Manual.” In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as “permeability.” Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

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.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

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.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

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 degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly 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

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

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

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

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.

Salty water (in tables). Water that is too salty for consumption by livestock.

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-sized particles.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

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.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (in tables). 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.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

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

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

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.

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.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 percent
Gently sloping	1 to 5 percent
Moderately sloping	5 to 8 percent
Strongly sloping	8 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 35 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25

Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion 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).

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.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E 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."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

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. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

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 generally is 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."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

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.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

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.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Greenville, Alabama)

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*	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-----	58.3	35.7	47.0	78	9	86	5.40	3.16	7.39	7	0.0
February----	62.2	37.8	50.0	82	16	114	6.07	3.43	8.41	7	0.4
March-------	70.9	45.1	58.0	87	23	277	6.29	3.81	8.52	7	0.0
April-------	78.5	52.3	65.4	91	33	459	4.35	1.82	6.50	5	0.0
May---------	84.5	59.7	72.1	94	43	674	4.02	2.20	5.62	5	0.0
June--------	89.5	66.7	78.1	99	54	842	4.57	2.51	6.39	6	0.0
July--------	91.5	69.5	80.5	100	62	938	5.19	3.09	7.07	8	0.0
August------	90.9	69.0	79.9	99	61	917	4.73	2.33	6.82	7	0.0
September---	87.2	64.9	76.0	97	47	772	3.99	2.10	5.64	5	0.0
October-----	78.7	53.8	66.2	91	35	503	2.30	0.57	3.67	3	0.0
November----	69.8	45.2	57.5	85	23	254	4.01	2.37	5.48	5	0.0
December----	61.7	38.3	50.0	80	14	128	5.27	3.20	7.14	6	0.0
Yearly:											
Average---	77.0	53.1	65.1	---	---	---	---	---	---	---	---
Extreme---	105	-1	---	101	6	---	---	---	---	---	---
Total-----	---	---	---	---	---	5,964	56.20	35.40	65.84	71	0.4

* 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 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Greenville, Alabama)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Mar. 12	Mar. 30	Apr. 9
2 years in 10 later than--	Mar. 4	Mar. 22	Apr. 2
5 years in 10 later than--	Feb. 16	Mar. 6	Mar. 21
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 19	Nov. 12	Oct. 29
2 years in 10 earlier than--	Nov. 28	Nov. 19	Nov. 3
5 years in 10 earlier than--	Dec. 15	Dec. 1	Nov. 14

Table 3.--Growing Season

(Recorded in the period 1961-90 at Greenville, Alabama)

Probability	Daily minimum temperature during growing season		
	Higher than 24°F	Higher than 28°F	Higher than 32°F
	Days	Days	Days
9 years in 10	257	238	213
8 years in 10	272	249	221
5 years in 10	300	269	237
2 years in 10	328	289	252
1 year in 10	342	300	260

Table 4.--Suitability and Limitations of General Soil Map Units for Specified Uses

Map unit	Extent of area	Cultivated crops	Pasture and hay	Woodland	Urban uses
	Pct				
1. Congaree-Leeper------	1	Poorly suited: wetness, flooding.	Poorly suited: wetness, flooding.	Suited: wetness, flooding, restricted use of equipment, seedling mortality.	Poorly suited: wetness, flooding.
2. Mantachie-Rains-Bethera-------------	9	Poorly suited: wetness, flooding.	Poorly suited: wetness, flooding.	Suited: wetness, flooding, restricted use of equipment, seedling mortality.	Poorly suited: wetness, flooding.
3. Demopolis-Searcy-Watsonia------------	4	Poorly suited: slope, droughtiness, hazard of erosion.	Poorly suited: slope, droughtiness.	Suited: restricted use of equipment, hazard of erosion, seedling mortality.	Poorly suited: slope, depth to rock, shrink-swell potential, slow and very slow permeability.
4. Luverne-Troup-Smithdale-----------	16	Poorly suited: slope, low fertility, hazard of erosion.	Suited: slope, low fertility, droughtiness.	Suited: restricted use of equipment, hazard of erosion, seedling mortality.	Poorly suited: slope, moderate and moderately slow permeability, low strength, shrink-swell potential.
5. Arundel-Luverne------	5	Poorly suited: slope, low fertility, hazard of erosion.	Suited: slope, low fertility.	Suited: restricted use of equipment, hazard of erosion.	Poorly suited: slope, shrink-swell potential, moderately slow and very slow permeability.
6. Luverne-Halso--------	40	Suited: low fertility, hazard of erosion.	Well suited---	Well suited-----	Poorly suited: slope, shrink-swell potential, moderately slow and very slow permeability.
7. Orangeburg-Malbis----	13	Suited: low fertility, hazard of erosion.	Well suited---	Well suited-----	Well suited.

Table 4.--Suitability and Limitations of General Soil Map Units for Specified Uses--Continued

Map unit	Extent of area	Cultivated crops	Pasture and hay	Woodland	Urban uses
	Pct				
8. Greenville-Orangeburg-Lucedale-	6	Well suited---	Well suited---	Well suited-----	Well suited.
9. Bonneau-Eunola-Benndale------------	6	Well suited---	Well suited---	Well suited-----	Suited: wetness, flooding.

Table 5.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AaB	Alaga-Troup complex, 0 to 5 percent slopes	3,330	0.7
ArC	Arundel fine sandy loam, 5 to 8 percent slopes	2,480	0.5
ArF	Arundel fine sandy loam, 8 to 35 percent slopes	15,600	3.1
BeB	Benndale sandy loam, 1 to 5 percent slopes	3,750	0.8
BgB	Bigbee loamy sand, 0 to 3 percent slopes, rarely flooded	370	0.1
BoB	Bonneau loamy sand, 0 to 5 percent slopes	9,080	1.8
BoC	Bonneau loamy sand, 5 to 8 percent slopes	5,030	1.0
CaA	Cahaba fine sandy loam, 0 to 2 percent slopes, rarely flooded	470	0.1
CoA	Congaree loam, 0 to 1 percent slopes, frequently flooded	6,500	1.3
DbF	Demopolis-Brantley complex, 15 to 35 percent slopes	6,450	1.3
DwD	Demopolis-Watsonia complex, 2 to 8 percent slopes	10,470	2.1
EuA	Eunola sandy loam, 0 to 2 percent slopes, rarely flooded	9,570	1.9
GrB	Greenville sandy loam, 1 to 3 percent slopes	8,610	1.7
GsC2	Greenville sandy clay loam, 3 to 8 percent slopes, eroded	7,450	1.5
GtD3	Greenville clay loam, 8 to 15 percent slopes, severely eroded	2,050	0.4
HaB	Halso silt loam, 1 to 3 percent slopes	17,460	3.5
HbC	Halso fine sandy loam, 3 to 8 percent slopes	26,340	5.3
LeA	Leeper clay loam, 0 to 1 percent slopes, frequently flooded	1,950	0.4
LfB	Lucedale sandy loam, 1 to 3 percent slopes	2,970	0.6
LgB	Lucy loamy sand, 0 to 5 percent slopes	3,160	0.6
LuB	Luverne sandy loam, 1 to 5 percent slopes	25,780	5.2
LuC	Luverne sandy loam, 5 to 8 percent slopes	46,620	9.3
LuE	Luverne sandy loam, 8 to 25 percent slopes	42,540	8.5
LvC	Luverne-Urban land complex, 2 to 8 percent slopes	550	0.1
LyA	Lynchburg sandy loam, 0 to 2 percent slopes	13,100	2.6
MaB	Macon fine sandy loam, 1 to 5 percent slopes	760	0.2
MbB	Malbis fine sandy loam, 1 to 3 percent slopes	4,270	0.9
MbC	Malbis fine sandy loam, 5 to 8 percent slopes	1,460	0.3
MIA	Mantachie, Bibb, and Iuka soils, 0 to 1 percent slopes, frequently flooded	56,120	11.2
OkC2	Oktibbeha clay loam, 5 to 10 percent slopes, eroded	1,550	0.3
OrB	Orangeburg sandy loam, 1 to 5 percent slopes	23,420	4.7
OrC	Orangeburg sandy loam, 5 to 8 percent slopes	32,690	6.6
OuC	Orangeburg-Urban land complex, 2 to 8 percent slopes	2,010	0.4
Pt	Pits	280	0.1
RaA	Rains sandy loam, 0 to 2 percent slopes	2,330	0.5
RbA	Rains-Bethera complex, 0 to 1 percent slopes, occasionally flooded	32,620	6.5
SeC2	Searcy sandy clay loam, 2 to 8 percent slopes, eroded	2,980	0.6
SeD3	Searcy sandy clay loam, 8 to 15 percent slopes, severely eroded	1,760	0.4
SmD	Smithdale sandy loam, 8 to 15 percent slopes	5,590	1.1
SuD2	Sumter silty clay, 5 to 15 percent slopes, eroded	430	0.1
TaD	Troup-Alaga complex, 5 to 15 percent slopes	10,110	2.0
TsF	Troup-Luverne-Smithdale complex, 15 to 35 percent slopes	44,940	9.0
UdC	Udorthents, gently sloping, smooth	510	0.1
UdF	Udorthents, hilly, rough	2,010	0.4
	Water	1,130	0.2
	Total	498,650	100.0

Table 6.--Land Capability and Yields per Acre of Crops

(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)

Soil name and map symbol	Land capability	Cotton lint	Corn	Soybeans	Grain sorghum	Wheat	Peanuts	Tobacco
		Lbs	Bu	Bu	Bu	Bu	Lbs	Lbs
AaB------------- Alaga-Troup	IIIs	---	50	20	55	35	1,800	---
ArC------------- Arundel	IVe	---	---	---	---	---	---	---
ArF------------- Arundel	VIIe	---	---	---	---	---	---	---
BeB------------- Benndale	IIe	700	75	30	80	35	3,000	2,200
BgB------------- Bigbee	IIIs	400	50	20	60	30	1,500	---
BoB------------- Bonneau	IIs	500	65	25	85	35	2,900	2,600
BoC------------- Bonneau	IIIs	400	50	20	80	30	2,200	2,500
CaA------------- Cahaba	I	800	100	35	90	45	3,200	---
CoA------------- Congaree	IIIw	---	85	35	110	35	---	---
DbF------------- Demopolis- Brantley	VIIe	---	---	---	---	---	---	---
DwD------------- Demopolis- Watsonia	VIe	---	---	---	---	---	---	---
EuA------------- Eunola	IIw	---	100	35	100	35	3,000	---
GrB------------- Greenville	IIe	800	100	35	90	50	3,500	---
GsC2------------ Greenville	IVe	700	85	25	---	---	2,600	---
GtD3------------ Greenville	VIe	---	---	---	---	---	---	---
HaB------------- Halso	IIIe	500	70	30	35	30	---	---
HbC------------- Halso	IVe	---	---	---	---	---	---	---
LeA------------- Leeper	IVw	---	---	30	90	---	---	---
LfB------------- Lucedale	IIe	800	115	40	115	50	3,500	---

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Soil name and map symbol	Land capability	Cotton lint	Corn	Soybeans	Grain sorghum	Wheat	Peanuts	Tobacco
		Lbs	Bu	Bu	Bu	Bu	Lbs	Lbs
LgB------------ Lucy	IIs	500	65	20	85	30	2,500	---
LuB------------ Luverne	IIIe	700	70	30	75	35	---	---
LuC------------ Luverne	IVe	600	70	25	---	---	---	---
LuE------------ Luverne	VIIe	---	---	---	---	---	---	---
LvC*----------- Luverne-Urban land	---	---	---	---	---	---	---	---
LyA------------ Lynchburg	IIw	---	90	25	90	---	---	2,800
MaB------------ Macon	IIe	800	100	35	100	---	3,000	---
MbB------------ Malbis	IIe	750	100	35	---	35	3,500	2,200
MbC------------ Malbis	IIIe	650	80	30	80	30	3,000	1,800
MIA------------ Mantachie, Bibb, and Iuka	Vw	---	---	---	---	---	---	---
OkC2----------- Oktibbeha	IVe	---	---	25	---	30	---	---
OrB------------ Orangeburg	IIe	800	100	35	100	50	3,500	2,400
OrC------------ Orangeburg	IIIe	750	90	30	90	45	3,200	2,200
OuC*----------- Orangeburg-Urban land	---	---	---	---	---	---	---	---
Pt*------------ Pits	VIIIs	---	---	---	---	---	---	---
RaA------------ Rains	IIIw	---	---	25	90	45	---	2,200
RbA------------ Rains-Bethera	IVw	---	---	---	---	---	---	---
SeC2----------- Searcy	IIIe	450	65	20	---	25	---	---
SeD3----------- Searcy	VIe	---	---	---	---	---	---	---

See footnote at end of table.

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Soil name and map symbol	Land capability	Cotton lint	Corn	Soybeans	Grain sorghum	Wheat	Peanuts	Tobacco
		Lbs	Bu	Bu	Bu	Bu	Lbs	Lbs
SmD------------- Smithdale	IVe	400	55	25	---	---	---	---
SuD2------------ Sumter	VIe	---	---	---	---	---	---	---
TaD------------- Troup-Alaga	VIs	---	---	---	---	---	---	---
TsF------------- Troup-Luverne-Smithdale	VIIe	---	---	---	---	---	---	---
UdC------------- Udorthents	IVe	---	---	---	---	---	---	---
UdF------------- Udorthents	VIIe	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 7.-Yields per Acre of Pasture and Hay

(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)

Soil name and map symbol	Improved bermudagrass	Improved bermudagrass hay	Bahiagrass	Cool-season grass	Warm-season grass	Alfalfa hay
	AUM*	Tons	AUM*	AUM*	AUM*	Tons
AaB------------- Alaga-Troup	7.5	4.5	7.1	4.0	4.0	---
ArC------------- Arundel	---	---	6.0	---	---	---
ArF------------- Arundel	---	---	---	---	---	---
BeB------------- Benndale	9.0	5.5	8.5	4.0	4.5	4.5
BgB------------- Bigbee	7.5	4.5	7.5	4.0	---	---
BoB------------- Bonneau	8.5	4.0	8.0	5.0	4.0	---
BoC------------- Bonneau	8.0	4.0	7.5	5.0	4.0	---
CaA------------- Cahaba	10.0	6.0	10.0	5.0	5.0	5.0
CoA------------- Congaree	10.0	6.0	10.0	5.0	5.5	5.0
DbF------------- Demopolis- Brantley	---	---	---	---	---	---
DwD------------- Demopolis- Watsonia	---	---	---	---	---	---
EuA------------- Eunola	10.0	6.0	10.0	4.0	5.0	---
GrB------------- Greenville	11.0	5.0	9.0	4.5	5.0	5.0
GsC2------------ Greenville	9.0	4.5	7.0	4.0	4.5	3.5
GtD3------------ Greenville	---	---	---	---	---	---
HaB------------- Halso	8.5	5.0	8.5	4.5	4.5	3.5
HbC------------- Halso	8.0	4.5	8.0	4.5	4.5	---
LeA------------- Leeper	---	---	4.5	---	---	---

See footnotes at end of table.

Table 7.--Yields per Acre of Pasture and Hay--Continued

Soil name and map symbol	Improved bermudagrass	Improved bermudagrass hay	Bahiagrass	Cool-season grass	Warm-season grass	Alfalfa hay
	AUM*	Tons	AUM*	AUM*	AUM*	Tons
LfB------------ Lucedale	10.0	6.0	10.0	5.0	5.5	5.0
LgB------------ Lucy	8.5	5.0	8.0	5.0	4.0	---
LuB------------ Luverne	8.5	5.0	8.5	4.5	4.5	3.0
LuC------------ Luverne	8.0	4.5	8.0	4.0	4.0	---
LuE------------ Luverne	---	---	---	---	---	---
LvC**---------- Luverne-Urban land	---	---	---	---	---	---
LyA------------ Lynchburg	10.0	6.0	10.0	4.0	5.0	---
MaB------------ Macon	10.0	6.0	10.0	5.0	5.5	5.0
MbB------------ Malbis	9.5	6.0	8.5	4.5	5.0	4.0
MbC------------ Malbis	9.0	6.0	8.0	4.5	5.0	4.0
MIA------------ Mantachie, Bibb and Iuka	---	---	---	---	---	---
OkC2----------- Oktibbeha	---	---	4.5	---	---	---
OrB------------ Orangeburg	10.5	6.5	10.0	5.0	5.5	5.0
OrC------------ Orangeburg	10.0	6.0	9.5	5.0	5.0	4.0
OuC**---------- Orangeburg-Urban land	---	---	---	---	---	---
Pt**----------- Pits	---	---	---	---	---	---
RaA------------ Rains	---	---	6.0	---	4.5	---
RbA------------ Rains-Bethera	---	---	5.5	---	4.0	---
SeC2----------- Searcy	8.5	8.5	8.0	4.5	4.0	---

See footnotes at end of table.

Table 7.--Yields per Acre of Pasture and Hay--Continued

Soil name and map symbol	Improved bermudagrass	Improved bermudagrass hay	Bahiagrass	Cool-season grass	Warm-season grass	Alfalfa hay
	AUM*	Tons	AUM*	AUM*	AUM*	Tons
SeD3------------ Searcy	---	---	8.0	---	---	---
SmD------------- Smithdale	---	---	8.0	---	---	---
SuD2------------ Sumter	---	---	---	---	---	---
TaD------------- Troup-Alaga	6.5	---	5.0	---	---	---
TsF------------- Troup-Luverne-Smithdale	---	---	---	---	---	---
UdC------------- Udorthents	5.0	5.0	3.5	---	---	---
UdF------------- 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 8.--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)

Soil name and map symbol	Ordi- nation symbol	Management concerns: Erosion hazard	Management concerns: Equip- ment limita- tion	Management concerns: Seedling mortal- ity	Management concerns: Plant competi- tion	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
AaB**:									
Alaga	8S	Slight	Moderate	Moderate	Moderate	Loblolly pine	80	1.8	Loblolly pine, slash pine, longleaf pine.
						Longleaf pine	70	---	
						Slash pine	80	---	
Troup	8S	Slight	Moderate	Moderate	Moderate	Loblolly pine	80	1.8	Loblolly pine, longleaf pine, slash pine.
						Longleaf pine	70	---	
						Slash pine	80	---	
ArC: Arundel	8C	Slight	Moderate	Slight	Moderate	Loblolly pine	80	1.8	Loblolly pine, shortleaf pine.
						Shortleaf pine	70	---	
ArF: Arundel	8R	Moderate	Moderate	Moderate	Moderate	Loblolly pine	80	1.8	Loblolly pine, shortleaf pine.
						Shortleaf pine	70	---	
BeB: Benndale	10A	Slight	Slight	Slight	Moderate	Loblolly pine	95	2.5	Loblolly pine, slash pine, longleaf pine.
						Longleaf pine	80	---	
						Slash pine	95	---	
BgB: Bigbee	9S	Slight	Moderate	Moderate	Slight	Loblolly pine	85	2.1	Loblolly pine, longleaf pine.
						Longleaf pine	---	---	
BoB, BoC: Bonneau	9S	Slight	Moderate	Moderate	Slight	Loblolly pine	90	2.2	Loblolly pine, longleaf pine.
						Longleaf pine	80	---	
CaA: Cahaba	9A	Slight	Slight	Slight	Moderate	Loblolly pine	90	2.2	Loblolly pine, slash pine, longleaf pine, sweetgum, water oak.
						Slash pine	90	---	
						Longleaf pine	70	---	
						Sweetgum	90	---	
						Water oak	---	---	
CoA: Congaree	9A	Slight	Moderate	Slight	Moderate	Loblolly pine	90	2.2	Loblolly pine, sweetgum, yellow-poplar, American sycamore, cherrybark oak, eastern cottonwood.
						Sweetgum	100	---	
						Yellow-poplar	110	---	
						Eastern cottonwood	110	---	
						American sycamore	100	---	
						Water oak	100	---	
DbF**:									
Demopolis	3R	Moderate	Moderate	Severe	Moderate	Eastern redcedar	40	*	Eastern redcedar.
Brantley	8R	Moderate	Moderate	Slight	Moderate	Loblolly pine	85	2.1	Loblolly pine.
						Shortleaf pine	70	---	
DwD**:									
Demopolis	3D	Slight	Slight	Severe	Moderate	Eastern redcedar	40	*	Eastern redcedar.
Watsonia	7D	Slight	Moderate	Severe	Moderate	Loblolly pine	75	1.6	Loblolly pine.
						Eastern redcedar	40	---	

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Volume*	Trees to plant
EuA------------- Eunola	9W	Slight	Moderate	Slight	Moderate	Loblolly pine-------	90	2.2	Loblolly pine,
						Slash pine----------	95	---	slash pine,
						Sweetgum------------	95	---	sweetgum,
						Yellow-poplar-------	95	---	water oak,
						Water oak-----------	95	---	yellow-poplar.
GrB------------- Greenville	8A	Slight	Slight	Slight	Moderate	Loblolly pine-------	85	2.1	Loblolly pine,
						Longleaf pine-------	80	---	longleaf pine,
						Slash pine----------	85	---	slash pine.
GsC2, GtD3------ Greenville	8A	Slight	Slight	Moderate	Moderate	Loblolly pine-------	85	2.1	Loblolly pine,
						Longleaf pine-------	80	---	longleaf pine,
						Slash pine----------	85	---	slash pine.
HaB, HbC-------- Halso	9C	Slight	Moderate	Slight	Severe	Loblolly pine-------	85	2.1	Loblolly pine,
						Slash pine----------	85	---	slash pine,
						Shortleaf pine------	80	---	water oak,
						Water oak-----------	90	---	sweetgum.
						Sweetgum------------	90	---	
LeA------------- Leeper	7W	Slight	Moderate	Severe	Moderate	Water oak-----------	95	1.1	Water oak,
						Eastern cottonwood--	100	---	sweetgum,
						Sweetgum------------	95	---	green ash,
						Green ash-----------	90	---	American
						American sycamore---	100	---	sycamore.
LfB------------- Lucedale	9A	Slight	Slight	Slight	Slight	Loblolly pine-------	90	2.2	Loblolly pine,
						Longleaf pine-------	80	---	slash pine,
						Slash pine----------	90	---	longleaf pine.
LgB------------- Lucy	8S	Slight	Moderate	Moderate	Moderate	Loblolly pine-------	85	2.1	Loblolly pine,
						Longleaf pine-------	75	---	longleaf pine,
						Slash pine----------	85	---	slash pine.
LuB, LuC-------- Luverne	9C	Slight	Moderate	Slight	Moderate	Loblolly pine-------	90	2.2	Loblolly pine,
						Slash pine----------	90	---	slash pine,
						Shortleaf pine------	80	---	longleaf pine.
LuE------------- Luverne	9R	Moderate	Moderate	Slight	Moderate	Loblolly pine-------	90	2.2	Loblolly pine,
						Slash pine----------	80	---	slash pine,
						Shortleaf pine------	80	---	longleaf pine.
LvC**:									
Luverne.									
Urban land.									
LyA------------- Lynchburg	8W	Slight	Moderate	Slight	Severe	Loblolly pine-------	85	2.1	Loblolly pine,
						Yellow-poplar-------	90	---	American
						Sweetgum------------	90	---	sycamore,
						White oak-----------	80	---	sweetgum,
									water oak.
MaB------------- Macon	9A	Slight	Slight	Slight	Moderate	Loblolly pine-------	90	2.2	Loblolly pine,
						Shortleaf pine------	70	---	longleaf pine.
						Longleaf pine-------	70	---	
MbB, MbC-------- Malbis	9A	Slight	Slight	Slight	Moderate	Loblolly pine-------	90	2.2	Loblolly pine,
						Slash pine----------	90	---	slash pine.
						Longleaf pine-------	80	---	

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
MIA**:									
Mantachie	11W	Slight	Severe	Severe	Severe	Loblolly pine	100	2.7	Loblolly pine,
						Eastern cottonwood	90	---	cherrybark
						Green ash	80	---	oak, green
						Sweetgum	95	---	ash, sweetgum,
						Water oak	90	---	water oak.
Bibb	6W	Slight	Severe	Severe	Severe	Water oak	90	1.0	Loblolly pine,
						Loblolly pine	100	---	sweetgum,
						Sweetgum	90	---	green ash,
						Water oak	90	---	water oak.
Iuka	12W	Slight	Moderate	Moderate	Severe	Loblolly pine	105	2.9	Loblolly pine,
						Sweetgum	110	---	sweetgum,
						Eastern cottonwood	110	---	eastern
						Water oak	105	---	cottonwood,
						American sycamore	110	---	green ash,
									yellow-poplar,
									water oak.
OkC2 Oktibbeha	9C	Slight	Moderate	Severe	Moderate	Loblolly pine	90	2.2	Loblolly pine.
						Shortleaf pine	80	---	
						Eastern redcedar	40	---	
OrB, OrC Orangeburg	8A	Slight	Slight	Slight	Moderate	Loblolly pine	85	2.1	Loblolly pine,
						Slash pine	85	---	slash pine,
						Longleaf pine	75	---	longleaf pine.
OuC**:									
Orangeburg.									
Urban land.									
RaA Rains	9W	Slight	Severe	Severe	Severe	Loblolly pine	90	2.2	Loblolly pine,
						Sweetgum	90	---	slash pine,
						Water oak	85		sweetgum,
									water oak.
RbA**:									
Rains	9W	Slight	Severe	Severe	Severe	Loblolly pine	90	2.2	Loblolly pine,
						Sweetgum	90	---	slash pine,
						Water oak	85	---	sweetgum,
									water oak.
Bethera	9W	Slight	Severe	Severe	Severe	Loblolly pine	90	2.2	Loblolly pine,
						Slash pine	90	---	slash pine,
						Water oak	80	---	sweetgum,
									water oak.
SeC2, SeD3 Searcy	12C	Slight	Moderate	Moderate	Moderate	Loblolly pine	105	2.9	Loblolly pine.
						Shortleaf pine	---	---	slash pine.
						Sweetgum	---	---	
SmD Smithdale	8A	Slight	Slight	Slight	Moderate	Loblolly pine	85	2.1	Loblolly pine,
						Longleaf pine	70	---	longleaf pine,
						Slash pine	85	---	slash pine.

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordi-nation symbol	Management concerns: Erosion hazard	Management concerns: Equip-ment limita-tion	Management concerns: Seedling mortal-ity	Management concerns: Plant competi-tion	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
SuD2------------ Sumter	3C	Moderate	Moderate	Severe	Moderate	Eastern redcedar----	40	*	Eastern redcedar.
TaD**:									
Troup----------	8S	Slight	Moderate	Moderate	Moderate	Loblolly pine-------	80	1.8	Loblolly pine,
						Longleaf pine-------	70	---	longleaf pine,
						Slash pine----------	80	---	slash pine.
Alaga----------	8S	Slight	Moderate	Moderate	Moderate	Loblolly pine-------	80	1.8	Loblolly pine,
						Longleaf pine-------	70	---	slash pine.
						Slash pine----------	80	---	longleaf pine.
TsF**:									
Troup----------	8R	Moderate	Moderate	Moderate	Moderate	Loblolly pine-------	80	1.8	Loblolly pine,
						Longleaf pine-------	70	---	longleaf pine.
Luverne--------	9R	Moderate	Moderate	Slight	Moderate	Loblolly pine-------	90	2.2	Loblolly pine,
						Slash pine----------	90	---	slash pine.
						Shortleaf pine------	80	---	
Smithdale------	8R	Moderate	Moderate	Slight	Moderate	Loblolly pine-------	85	2.1	Loblolly pine,
						Longleaf pine-------	75	---	longleaf pine,
						Slash pine----------	85	---	slash pine.
UdC------------- Udorthents	7D	Moderate	Moderate	Severe	Slight	Loblolly pine-------	75	1.4	Loblolly pine.
						Shortleaf pine------	60	---	
UdF------------- Udorthents	6R	Severe	Moderate	Severe	Slight	Loblolly pine-------	70	1.4	Loblolly pine.
						Shortleaf pine------	60	---	

* Volume is expressed as the average yearly growth in cords per acre per year calculated at the age of 25 years for fully stocked, unmanaged stands of loblolly pine and at the age of 30 years for fully stocked, unmanaged stands of oak. Volume for eastern redcedar is 140 board feet per acre per year calculated at the age of 40 years for fully stocked, natural stands.

** 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)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AaB*:					
Alaga	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
Troup	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
ArC Arundel	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight	Moderate: large stones, depth to rock.
ArF Arundel	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Moderate: slope.	Severe: slope.
BeB Benndale	Slight	Slight	Moderate: slope.	Slight	Slight.
BgB Bigbee	Severe: flooding.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: droughty.
BoB Bonneau	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
BoC Bonneau	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty.
CaA Cahaba	Severe: flooding.	Slight	Slight	Slight	Slight.
CoA Congaree	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
DbF*:					
Demopolis	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: large stones, slope, depth to rock.	Severe: slope.	Severe: large stones, slope, depth to rock.
Brantley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
DwD*:					
Demopolis	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, slope.	Slight	Severe: depth to rock.
Watsonia	Severe: percs slowly, too clayey, depth to rock.	Severe: percs slowly, too clayey, depth to rock.	Severe: slope, too clayey, depth to rock.	Severe: too clayey.	Severe: depth to rock, too clayey.
EuA Eunola	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.

See footnote at end of table.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GrB, GsC2: Greenville	Slight	Slight	Moderate: slope.	Slight	Slight.
GtD3: Greenville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
HaB, HbC: Halso	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight	Slight.
LeA: Leeper	Severe: flooding, wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
LfB: Lucedale	Slight	Slight	Moderate: slope.	Slight	Slight.
LgB: Lucy	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
LuB: Luverne	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight	Slight.
LuC: Luverne	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
LuE: Luverne	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
LvC*:					
Luverne	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight	Slight.
Urban land	Variable	Variable	Variable	Variable	Variable.
LyA: Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
MaB: Macon	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
MbB: Malbis	Slight	Slight	Moderate: slope.	Slight	Slight.
MbC: Malbis	Slight	Slight	Severe: slope.	Slight	Slight.
MIA*:					
Mantachie	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
Bibb	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.

See footnote at end of table.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
MIA*:					
Iuka	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
OkC2 Oktibbeha	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight	Slight.
OrB Orangeburg	Slight	Slight	Moderate: slope.	Slight	Slight.
OrC Orangeburg	Slight	Slight	Severe: slope.	Slight	Slight.
OuC*:					
Orangeburg	Slight	Slight	Moderate: slope.	Slight	Slight.
Urban land	Variable	Variable	Variable	Variable	Variable.
Pt* Pits	Variable	Variable	Variable	Variable	Variable.
RaA Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
RbA*:					
Rains	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Bethera	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
SeC2 Searcy	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
SeD3 Searcy	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Slight	Moderate: slope.
SmD Smithdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
SuD2 Sumter	Severe: too clayey.	Severe: too clayey.	Severe: slope, too clayey.	Severe: too clayey, erodes easily.	Severe: too clayey.
TaD*:					
Troup	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
Alaga	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.

See footnote at end of table.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
TsF*:					
Troup	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Luverne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
UdC, UdF Udorthents	Variable	Variable	Variable	Variable	Variable.

* 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)

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
AaB*:										
Alaga	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Troup	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
ArC Arundel	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ArF Arundel	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BeB Benndale	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BgB Bigbee	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.
BoB, BoC Bonneau	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CaA Cahaba	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CoA Congaree	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
DbF*:										
Demopolis	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Brantley	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
DwD*:										
Demopolis	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Watsonia	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
EuA Eunola	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GrB Greenville	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
GsC2, GtD3 Greenville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HaB Halso	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HbC Halso	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
LeA---Leeper	Poor	Fair	Fair	Good	---	Fair	Good	Fair	Good	Fair.
LfB---Lucedale	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LgB---Lucy	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
LuB---Luverne	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LuC---Luverne	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LuE---Luverne	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
LvC*:										
Luverne---	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land---	---	---	---	---	---	---	---	---	---	---
LyA---Lynchburg	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
MaB---Macon	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MbB---Malbis	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MbC---Malbis	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MIA*:										
Mantachie---	Poor	Fair	Fair	Good	---	Fair	Fair	Fair	Good	Fair.
Bibb---	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Iuka---	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
OkC2---Oktibbeha	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
OrB---Orangeburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
OrC---Orangeburg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
OuC*:										
Orangeburg---	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land---	---	---	---	---	---	---	---	---	---	---
Pt*---Pits	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.

See footnote at end of table.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
RaA: Rains	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.
RbA*:										
Rains	Fair	Fair	Poor	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Bethera	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
SeC2: Searcy	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
SeD3: Searcy	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
SmD: Smithdale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SuD2: Sumter	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
TaD*:										
Troup	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Alaga	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
TsF*:										
Troup	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Luverne	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Smithdale	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
UdC: Udorthents	Fair	Fair	Fair	---	Good	Poor	Poor	Fair	Fair	Poor.
UdF: Udorthents	Poor	Fair	Fair	---	Good	Very poor.	Very poor.	Fair	Good	Very poor.

* 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. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AaB*:						
Alaga	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
Troup	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
ArC Arundel	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: large stones, depth to rock.
ArF Arundel	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
BeB Benndale	Slight	Slight	Slight	Slight	Slight	Slight.
BgB Bigbee	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: droughty.
BoB Bonneau	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
BoC Bonneau	Severe: cutbanks cave.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Moderate: droughty.
CaA Cahaba	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
CoA Congaree	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
DbF*:						
Demopolis	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: large stones, slope, depth to rock.
Brantley	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
DwD*:						
Demopolis	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Severe: depth to rock.
Watsonia	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Severe: depth to rock, too clayey.

See footnote at end of table.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
EuA-------------- Eunola	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Moderate: wetness.
GrB-------------- Greenville	Moderate: too clayey.	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
GsC2------------- Greenville	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
GtD3------------- Greenville	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
HaB, HbC---------- Halso	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
LeA-------------- Leeper	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Severe: flooding.
LfB-------------- Lucedale	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
LgB-------------- Lucy	Moderate: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
LuB-------------- Luverne	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
LuC-------------- Luverne	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
LuE-------------- Luverne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
LvC*:						
Luverne----------	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Urban land-------	Variable-------	Variable-------	Variable-------	Variable-------	Variable-------	Variable.
LyA-------------- Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
MaB-------------- Macon	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, shrink-swell.	Slight.
MbB-------------- Malbis	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Slight.
MbC-------------- Malbis	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Slight---------	Slight.

See footnote at end of table.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MIA*:						
Mantachie	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
Bibb	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Iuka	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
OkC2 Oktibbeha	Severe: cutbanks cave.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Severe: too clayey.
OrB Orangeburg	Slight	Slight	Slight	Slight	Slight	Slight.
OrC Orangeburg	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
OuC*:						
Orangeburg	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
Pt* Pits	Variable	Variable	Variable	Variable	Variable	Variable.
RaA Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
RbA*:						
Rains	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness.
Bethera	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
SeC2 Searcy	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.	Slight.
SeD3 Searcy	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.
SmD Smithdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.

See footnote at end of table.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
SuD2: Sumter	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: too clayey, slope.
TaD*:						
Troup	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Alaga	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
TsF*:						
Troup	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Luverne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
UdC, UdF: Udorthents	Variable	Variable	Variable	Variable	Variable	Variable.

* 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," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AaB*:					
Alaga	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Troup	Slight	Severe: seepage.	Moderate: too sandy.	Severe: seepage.	Poor: seepage.
ArC Arundel	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
ArF Arundel	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
BeB Benndale	Slight	Moderate: seepage, slope.	Severe: seepage.	Slight	Good.
BgB Bigbee	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, wetness.	Severe: seepage.	Poor: seepage, too sandy.
BoB, BoC Bonneau	Severe: wetness.	Severe: seepage.	Severe: wetness.	Severe: seepage.	Good.
CaA Cahaba	Moderate: flooding.	Severe: seepage.	Severe: seepage.	Moderate: flooding.	Fair: thin layer.
CoA Congaree	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
DbF*:					
Demopolis	Severe: depth to rock, slope.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Brantley	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, slope.
DwD*:					
Demopolis	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.

See footnote at end of table.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
DwD*:					
Watsonia	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
EuA Eunola	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: too clayey, wetness, thin layer.
GrB, GsC2 Greenville	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
GtD3 Greenville	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
HaB, HbC Halso	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
LeA Leeper	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
LfB Lucedale	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
LgB Lucy	Slight	Severe: seepage.	Slight	Severe: seepage.	Fair: too clayey.
LuB, LuC Luverne	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
LuE Luverne	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
LvC*:					
Luverne	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Urban land	Variable	Variable	Variable	Variable	Variable.
LyA Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
MaB Macon	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
MbB, MbC Malbis	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.

See footnote at end of table.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MIA*:					
Mantachie	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Bibb	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: small stones, wetness.
Iuka	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
OkC2 Oktibbeha	Severe: percs slowly.	Severe: slope.	Severe: too clayey, too acid.	Slight	Poor: too clayey, hard to pack.
OrB, OrC Orangeburg	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
OuC*:					
Orangeburg	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
Urban land	Variable	Variable	Variable	Variable	Variable.
Pt* Pits	Variable	Variable	Variable	Variable	Variable.
RaA Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
RbA*:					
Rains	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Bethera	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
SeC2 Searcy	Severe: wetness, percs slowly.	Moderate: slope.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
SeD3 Searcy	Severe: wetness, percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
SmD Smithdale	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.
SuD2 Sumter	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.

See footnote at end of table.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
TaD*:					
Troup	Moderate: slope.	Severe: seepage, slope.	Moderate: slope, too sandy.	Severe: seepage.	Poor: seepage.
Alaga	Moderate: slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
TsF*:					
Troup	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: seepage, slope.
Luverne	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
UdC, UdF Udorthents	Variable	Variable	Variable	Variable	Variable.

* 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," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AaB*:				
Alaga	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Troup	Good	Probable	Improbable: too sandy.	Fair: too sandy.
ArC Arundel	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
ArF Arundel	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
BeB Benndale	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
BgB Bigbee	Good	Probable	Improbable: too sandy.	Poor: too sandy.
BoB, BoC Bonneau	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
CaA Cahaba	Good	Probable	Improbable: too sandy.	Fair: too clayey.
CoA Congaree	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
DbF*:				
Demopolis	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Brantley	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
DwD*:				
Demopolis	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Watsonia	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey.

See footnote at end of table.

Table 13.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
EuA: Eunola	Fair: wetness.	Probable	Improbable: too sandy.	Fair: too clayey, small stones, thin layer.
GrB, GsC2, GtD3: Greenville	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
HaB, HbC: Halso	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
LeA: Leeper	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
LfB: Lucedale	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
LgB: Lucy	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
LuB, LuC: Luverne	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
LuE: Luverne	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
LvC*:				
Luverne	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Urban land	Variable	Variable	Variable	Variable.
LyA: Lynchburg	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
MaB: Macon	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, thin layer.
MbB, MbC: Malbis	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
MIA*:				
Mantachie	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Bibb	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
Iuka	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

Table 13.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
OkC2------------------ Oktibbeha	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, too acid.
OrB, OrC------------- Orangeburg	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
OuC*:				
Orangeburg-----------	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Urban land-----------	Variable------------	Variable------------	Variable------------	Variable.
Pt*------------------ Pits	Variable------------	Variable------------	Variable------------	Variable.
RaA------------------ Rains	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
RbA*:				
Rains----------------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Bethera--------------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
SeC2, SeD3----------- Searcy	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
SmD------------------ Smithdale	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
SuD2----------------- Sumter	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
TaD*:				
Troup----------------	Good----------------	Probable------------	Improbable: too sandy.	Fair: too sandy, slope.
Alaga----------------	Good----------------	Probable------------	Improbable: too sandy.	Poor: too sandy.
TsF*:				
Troup----------------	Poor: slope.	Probable------------	Improbable: too sandy.	Poor: slope.
Luverne--------------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Smithdale------------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
UdC, UdF------------- Udorthents	Variable------------	Improbable: excess fines.	Improbable: excess fines.	Variable.

* 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. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
AaB*:						
Alaga	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty, rooting depth.
Troup	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
ArC Arundel	Moderate: depth to rock, slope.	Severe: hard to pack.	Deep to water	Slope, percs slowly.	Depth to rock	Depth to rock.
ArF Arundel	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, percs slowly.	Slope, depth to rock.	Slope, depth to rock.
BeB Benndale	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	Favorable	Favorable.
BgB Bigbee	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy	Droughty.
BoB Bonneau	Severe: seepage.	Severe: thin layer.	Deep to water	Droughty, fast intake.	Soil blowing	Droughty.
BoC Bonneau	Severe: seepage.	Severe: thin layer.	Deep to water	Slope, droughty, fast intake.	Soil blowing	Droughty.
CaA Cahaba	Severe: seepage.	Moderate: thin layer, piping.	Deep to water	Favorable	Favorable	Favorable.
CoA Congaree	Moderate: seepage.	Severe: piping.	Flooding	Wetness	Erodes easily, wetness.	Erodes easily.
DbF*:						
Demopolis	Severe: depth to rock, slope.	Severe: large stones.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Slope, droughty, depth to rock.
Brantley	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope, percs slowly.	Slope, percs slowly.	Slope, percs slowly.
DwD*:						
Demopolis	Severe: depth to rock.	Severe: thin layer.	Deep to water	Depth to rock, slope.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
Watsonia	Severe: depth to rock.	Severe: hard to pack, thin layer.	Deep to water	Slope, slow intake, percs slowly, depth to rock.	Depth to rock, erodes easily.	Erodes easily, depth to rock.

See footnote at end of table.

Table 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
EuA: Eunola	Severe: seepage.	Severe: piping, wetness.	Favorable	Wetness	Wetness	Favorable.
GrB: Greenville	Moderate: seepage.	Severe: piping.	Deep to water	Favorable	Favorable	Favorable.
GsC2: Greenville	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	Favorable	Favorable.
GtD3: Greenville	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
HaB: Halso	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Percs slowly	Percs slowly	Percs slowly.
HbC: Halso	Moderate: depth to rock, slope.	Severe: hard to pack.	Deep to water	Slope, percs slowly.	Percs slowly	Percs slowly.
LeA: Leeper	Slight	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
LfB: Lucedale	Moderate: seepage.	Severe: piping.	Deep to water	Favorable	Favorable	Favorable.
LgB: Lucy	Severe: seepage.	Severe: piping.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
LuB, LuC: Luverne	Moderate: slope.	Severe: piping, hard to pack.	Deep to water	Slope	Favorable	Favorable.
LuE: Luverne	Severe: slope.	Severe: piping, hard to pack.	Deep to water	Slope	Slope	Slope.
LvC*:						
Luverne	Moderate: slope.	Severe: piping, hard to pack.	Deep to water	Slope	Favorable	Favorable.
Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
LyA: Lynchburg	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness	Wetness	Wetness.
MaB: Macon	Moderate: slope.	Moderate: piping.	Deep to water	Percs slowly, slope.	Percs slowly	Percs slowly.
MbB: Malbis	Moderate: seepage.	Severe: piping.	Deep to water	Favorable	Favorable	Favorable.
MbC: Malbis	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	Favorable	Favorable.

See footnote at end of table.

Table 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
MIA*:						
Mantachie	Moderate: seepage.	Severe: piping, wetness.	Flooding	Wetness, flooding.	Wetness	Wetness.
Bibb	Moderate: seepage.	Severe: piping, wetness.	Flooding	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
Iuka	Moderate: seepage.	Severe: piping, wetness.	Flooding	Wetness, flooding.	Erodes easily, wetness.	Erodes easily, wetness.
OkC2 Oktibbeha	Moderate: slope.	Severe: hard to pack.	Deep to water	Slope, percs slowly.	Percs slowly	Percs slowly.
OrB, OrC Orangeburg	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope	Favorable	Favorable.
OuC*:						
Orangeburg	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope	Favorable	Favorable.
Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
Pt* Pits	Variable	Variable	Variable	Variable	Variable	Variable.
RaA Rains	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness	Wetness	Wetness.
RbA*:						
Rains	Moderate: seepage.	Severe: piping, wetness.	Flooding	Wetness, flooding.	Wetness	Wetness.
Bethera	Slight	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.
SeC2 Searcy	Moderate: slope.	Moderate: hard to pack, wetness.	Percs slowly, slope.	Slope, wetness.	Wetness	Percs slowly.
SeD3 Searcy	Severe: slope.	Moderate: hard to pack, wetness.	Percs slowly, slope.	Slope, wetness.	Slope, wetness.	Slope, percs slowly.
SmD Smithdale	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
SuD2 Sumter	Severe: slope.	Severe: thin layer.	Deep to water	Slope, slow intake, percs slowly.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.

See footnote at end of table.

Table 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
TaD*:						
Troup	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, slope.	Slope, too sandy, soil blowing.	Slope, droughty.
Alaga	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
TsF*:						
Troup	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, slope.	Slope, too sandy.	Slope, droughty.
Luverne	Severe: slope.	Severe: piping, hard to pack.	Deep to water	Slope	Slope	Slope.
Smithdale	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
UdC, UdF Udorthents	Variable	Variable	Variable	Variable	Variable	Variable.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 15.--Engineering Index Properties

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
AaB*:											
Alaga	0-6	Loamy sand	SM, SW-SM, SP-SM	A-2, A-1-B	0	100	100	40-80	10-35	<25	NP-4
	6-96	Loamy sand, loamy fine sand, sand.	SM, SW-SM, SP-SM	A-2	0	100	100	50-85	10-35	<25	NP-4
Troup	0-62	Loamy sand	SM, SP-SM	A-2, A-4	0	95-100	90-100	50-90	10-40	<20	NP
	62-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SC-SM, CL-ML, CL	A-4, A-2, A-6	0	95-100	90-100	60-90	24-55	19-40	4-20
ArC Arundel	0-6	Fine sandy loam	ML, SM	A-4, A-2-4	0-6	85-100	84-98	70-98	30-60	<20	NP
	6-23	Silty clay loam, silty clay, clay.	CL, CH	A-7	0-15	85-100	80-100	80-100	65-90	44-70	22-41
	23-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
ArF Arundel	0-6	Fine sandy loam	ML, SM	A-4, A-2-4	0-6	85-100	84-98	70-98	30-60	<20	NP
	6-24	Silty clay loam, silty clay, clay.	CL, CH	A-7	0-15	85-100	80-100	80-100	65-90	44-70	22-41
	24-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
BeB Benndale	0-12	Sandy loam	ML, SM, CL-ML, SC-SM	A-4, A-2-4	0	100	100	60-96	30-55	<25	NP-7
	12-42	Loam, sandy loam, fine sandy loam.	ML, SM, CL-ML, SC-SM	A-4	0	100	100	70-95	40-75	15-22	3-7
	42-66	Loam, sandy loam, sandy clay loam.	ML, SM, CL-ML, SC-SM	A-4, A-6	0	100	100	70-98	40-75	15-38	3-15
BgB Bigbee	0-10	Loamy sand	SM	A-2-4	0	100	95-100	60-90	15-30	<20	NP
	10-80	Sand, fine sand, loamy sand.	SP-SM, SM	A-2-4, A-3	0	85-100	85-100	50-75	5-20	<20	NP
BoB Bonneau	0-23	Loamy sand	SM	A-2	0	100	100	50-95	15-35	<20	NP
	23-72	Sandy loam, sandy clay loam, sandy clay.	CL, SC, SC-SM, CL-ML	A-4, A-6, A-2	0	100	100	60-95	25-60	20-40	4-18
BoC Bonneau	0-26	Loamy sand	SM	A-2	0	100	100	50-95	15-35	<20	NP
	26-72	Sandy loam, sandy clay loam, sandy clay.	CL, SC, SC-SM, CL-ML	A-4, A-6, A-2	0	100	100	60-95	25-60	20-40	4-18
CaA Cahaba	0-18	Fine sandy loam	SM	A-4, A-2-4	0	95-100	95-100	65-90	30-45	<20	NP
	18-48	Sandy clay loam, loam, clay loam.	SC, CL	A-4, A-6	0	90-100	80-100	75-90	40-75	22-35	8-15
	48-60	Loamy sand, sandy loam, fine sandy loam.	SM, SP-SM	A-2-4	0	95-100	90-100	60-85	10-35	<20	NP

See footnote at end of table.

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
CoA-------------- Congaree	0-8	Loam-------------	CL-ML, ML, CL	A-4	0	95-100	95-100	70-100	51-90	20-35	3-10
	8-58	Fine sandy loam, loam.	ML, CL, SM	A-4, A-6	0	95-100	95-100	70-100	40-90	25-50	3-22
	58-65	Variable---------	---	---	---	---	---	---	---	---	---
DbF*:											
Demopolis-------	0-4	Loam-------------	CL, CL-ML	A-4, A-6	5-10	85-100	75-90	65-85	50-80	24-44	6-20
	4-10	Silty clay loam, loam, clay loam.	CL, CL-ML	A-4, A-6	5-10	60-90	60-90	60-80	50-80	20-35	7-15
	10-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Brantley--------	0-6	Loam-------------	SM, SC-SM, ML, CL-ML	A-4	0	95-100	95-100	95-100	36-55	<30	NP-7
	6-36	Clay, clay loam, sandy clay.	CL, ML	A-7	0	95-100	95-100	90-100	60-75	41-50	16-22
	36-56	Sandy clay loam, clay loam.	SC, SM, CL, ML	A-4, A-6	0	95-100	95-100	80-100	36-70	30-40	7-15
	56-72	Fine sandy loam, loamy fine sand, sandy clay loam.	SM, SC, ML	A-2, A-4	0	95-100	95-100	70-100	30-60	<38	NP-9
DwD*:											
Demopolis-------	0-4	Loam-------------	CL, CL-ML	A-4, A-6	0-5	85-100	75-90	65-85	50-80	24-44	6-20
	4-10	Loam, clay loam, silty clay loam.	CL, CL-ML	A-4, A-6	0-5	60-90	60-90	60-80	50-80	20-35	4-15
	10-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Watsonia--------	0-4	Clay-------------	CL, CH	A-7	0	100	100	95-100	90-100	42-64	30-40
	4-16	Clay, silty clay	CH	A-7	0	100	100	95-100	95-100	65-85	45-60
	16-19	Clay, silty clay	CH	A-7	0	100	95-100	95-100	95-100	60-80	40-60
	19-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
EuA-------------- Eunola	0-8	Sandy loam-------	SM	A-2, A-4	0	100	98-100	60-85	30-50	<20	NP
	8-44	Sandy clay loam, clay loam, sandy loam.	SM, SC, SC-SM, CL	A-4, A-2, A-6	0	100	90-100	75-95	30-60	<36	NP-15
	44-54	Sandy loam, sandy clay loam.	SM, SC, SC-SM	A-2, A-4	0	100	98-100	60-70	30-40	<30	NP-10
	54-62	Sand, loamy sand, fine sand.	SM, SP-SM	A-2, A-3	0	100	98-100	50-75	5-30	<20	NP
GrB-------------- Greenville	0-8	Sandy loam-------	SM, SC, SC-SM, CL-ML	A-2, A-4	0	95-100	90-100	65-85	25-55	10-25	NP-10
	8-74	Clay loam, sandy clay, clay.	CL, SC, ML	A-6, A-7, A-4	0	98-100	95-100	80-99	40-80	28-50	7-25
GsC2------------- Greenville	0-5	Sandy clay loam	CL, SC, CL-ML, SC-SM	A-4, A-6	0	95-100	95-100	75-95	45-75	20-35	6-15
	5-80	Clay loam, sandy clay, clay.	CL, SC, ML	A-6, A-7, A-4	0	98-100	95-100	80-99	40-80	28-50	7-25
GtD3------------- Greenville	0-3	Clay loam--------	CL, SC, CL-ML, SC-SM	A-4, A-6	0	95-100	95-100	75-95	45-75	20-35	6-15
	3-72	Clay loam, sandy clay, clay.	CL, SC, ML	A-6, A-7, A-4	0	98-100	95-100	80-99	40-80	28-50	7-25

See footnote at end of table.

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
HaB--------------	0-3	Silt loam--------	CL-ML, CL	A-4, A-6	0	95-100	95-100	80-100	70-90	20-35	5-15
Halso	3-5	Clay loam, clay, silty clay loam.	ML, MH, CL, CH	A-7, A-6	0	95-100	95-100	85-100	70-95	35-60	10-30
	5-33	Clay, silty clay	ML, MH	A-7	0	95-100	95-100	90-100	80-98	45-70	15-35
	33-48	Clay loam, sandy clay loam, clay.	CL, CH, MH	A-6, A-7	0-10	65-95	65-80	60-80	55-75	30-65	12-30
	48-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
HbC--------------	0-4	Fine sandy loam	SM, ML	A-4	0	95-100	95-100	70-100	40-70	<20	NP
Halso	4-44	Clay, silty clay	ML, MH	A-7	0	95-100	95-100	90-100	80-98	45-70	15-35
	44-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
LeA--------------	0-3	Clay loam--------	CH, CL	A-7	0	100	100	90-100	85-95	45-55	25-35
Leeper	3-60	Clay, silty clay, silty clay loam.	CH	A-7	0	100	100	95-100	80-97	52-75	30-50
LfB--------------	0-8	Sandy loam-------	SM, ML	A-2, A-4	0	100	95-100	80-95	25-65	<30	NP-3
Lucedale	8-72	Sandy clay loam, clay loam, loam.	CL-ML, SC, CL, SC-SM	A-4, A-6, A-2	0	95-100	95-100	80-100	30-75	25-40	4-15
LgB--------------	0-33	Loamy sand-------	SM, SP-SM	A-2, A-4	0	98-100	95-100	50-90	10-40	<20	NP
Lucy	33-38	Sandy loam, fine sandy loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	97-100	95-100	55-95	15-50	10-30	NP-15
	38-60	Sandy clay loam, sandy loam.	SC, SC-SM, SM	A-2, A-6, A-4	0	100	95-100	60-95	20-50	20-40	3-20
LuB--------------	0-8	Sandy loam-------	ML, SM	A-4, A-2	0-5	87-100	84-100	80-100	30-60	<20	NP
Luverne	8-42	Clay loam, sandy clay, clay.	ML, MH	A-5, A-7, A-4	0-5	95-100	90-100	85-100	50-95	38-70	8-30
	42-60	Stratified loamy sand to sandy clay loam.	SM, ML	A-4, A-6, A-2, A-7	0-5	90-100	85-100	70-100	25-65	28-49	3-16
LuC--------------	0-11	Sandy loam-------	ML, SM	A-4, A-2	0-5	87-100	84-100	80-100	30-60	<20	NP
Luverne	11-40	Clay loam, sandy clay, clay.	ML, MH	A-5, A-7, A-4	0-5	95-100	90-100	85-100	50-95	38-70	8-30
	40-60	Stratified loamy sand to sandy clay loam.	SM, ML	A-4, A-6, A-2, A-7	0-5	90-100	85-100	70-100	25-65	28-49	3-16
LuE--------------	0-13	Sandy loam-------	ML, SM	A-4, A-2	0-5	87-100	84-100	80-100	30-60	<20	NP
Luverne	13-40	Clay loam, sandy clay, clay.	ML, MH	A-5, A-7, A-4	0-5	95-100	90-100	85-100	50-95	38-70	8-30
	40-60	Stratified loamy sand to sandy clay loam.	SM, ML	A-4, A-6, A-2, A-7	0-5	90-100	85-100	70-100	25-65	28-49	3-16
LvC*:											
Luverne---------	0-11	Sandy loam-------	ML, SM	A-4, A-2	0-5	87-100	84-100	80-100	30-60	<20	NP
	11-40	Clay loam, sandy clay, clay.	ML, MH	A-5, A-7, A-4	0-5	95-100	90-100	85-100	50-95	38-70	8-30
	40-60	Stratified loamy sand to sandy clay loam.	SM, ML	A-4, A-6, A-2, A-7	0-5	90-100	85-100	70-100	25-65	28-49	3-16
Urban land------	0-6	Variable---------	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
LyA-------------- Lynchburg	0-11	Sandy loam-------	SM, ML, SC-SM, CL-ML	A-2, A-4	0	92-100	90-100	75-100	25-55	<30	NP-7
	11-65	Sandy clay loam, sandy loam, clay loam.	SC-SM, SC, CL, CL-ML	A-2, A-4, A-6	0	92-100	90-100	70-100	25-67	15-40	4-18
MaB-------------- Macon	0-13	Fine sandy loam	SM, ML	A-4	0	98-100	90-100	70-95	40-75	<30	NP-4
	13-38	Clay loam, sandy clay loam, loam.	CL, SC	A-6	0	98-100	95-100	80-95	45-75	30-40	11-17
	38-72	Clay loam, sandy clay loam, sandy clay.	SC, CL	A-6, A-7	0	95-100	90-100	80-100	45-70	30-45	12-23
MbB-------------- Malbis	0-9	Fine sandy loam	SM, ML	A-4	0	100	97-100	91-97	40-62	<30	NP-5
	9-34	Loam, sandy clay loam, clay loam.	CL-ML, CL	A-4, A-6	0	99-100	95-100	80-100	55-70	21-35	5-11
	34-72	Sandy clay loam, clay loam.	ML, CL	A-4, A-5, A-6, A-7	0	98-100	96-100	90-100	56-80	30-49	4-15
MbC-------------- Malbis	0-6	Fine sandy loam	SM, ML	A-4	0	100	97-100	91-97	40-62	<30	NP-5
	6-30	Loam, sandy clay loam, clay loam.	CL-ML, CL	A-4, A-6	0	99-100	95-100	80-100	55-70	21-35	5-11
	30-72	Sandy clay loam, clay loam.	ML, CL	A-4, A-5, A-6, A-7	0	98-100	96-100	90-100	56-80	30-49	4-15
MIA*:											
Mantachie-------	0-3	Loam-------------	CL-ML, SC-SM, SM, ML	A-4	0-5	95-100	90-100	60-85	40-60	<20	NP-5
	3-60	Loam, clay loam, sandy clay loam.	CL, SC, SC-SM, CL-ML	A-4, A-6	0-5	95-100	90-100	80-95	45-80	20-40	5-15
Bibb------------	0-16	Loam-------------	ML, CL-ML	A-4	0-5	95-100	90-100	80-90	50-80	<25	NP-7
	16-60	Sandy loam, loam, silt loam.	SM, SC-SM, ML, CL-ML	A-2, A-4	0-10	60-100	50-100	40-100	30-90	<30	NP-7
Iuka------------	0-5	Loam-------------	ML, CL-ML	A-4	0	95-100	95-100	80-95	50-80	<30	NP-7
	5-48	Fine sandy loam, loam, sandy loam.	SM, SC-SM, ML, CL-ML	A-4	0	95-100	85-100	65-100	36-75	<30	NP-7
	48-60	Sandy loam, fine sandy loam, loamy sand.	SM, ML	A-2, A-4	0	95-100	90-100	70-100	25-60	<30	NP-7
OkC2------------- Oktibbeha	0-4	Clay-------------	CH	A-7	0	100	100	90-100	95-100	55-75	35-50
	4-26	Clay-------------	CH	A-7	0	100	100	95-100	95-100	55-75	35-50
	26-40	Clay-------------	CH	A-7	0	100	100	95-100	95-100	55-75	35-50
	40-60	Clay, silty clay	CL	A-7	0	100	100	90-100	90-100	42-65	30-45
OrB-------------- Orangeburg	0-13	Sandy loam-------	SM	A-2	0	98-100	95-100	75-95	20-35	<20	NP
	13-75	Sandy clay loam, sandy loam.	SC, CL, SM, SC-SM	A-6, A-4	0	98-100	95-100	71-96	38-58	22-40	3-19
OrC-------------- Orangeburg	0-8	Sandy loam-------	SM	A-2	0	98-100	95-100	75-95	20-35	<20	NP
	8-72	Sandy clay loam, sandy loam.	SC, CL, SM, SC-SM	A-6, A-4	0	98-100	95-100	71-96	38-58	22-40	3-19

See footnote at end of table.

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
OuC*:											
Orangeburg------	0-6	Sandy loam-------	SM	A-2	0	98-100	95-100	75-95	20-35	<20	NP
	6-72	Sandy clay loam, sandy loam.	SC, CL, SM, SC-SM	A-6, A-4	0	98-100	95-100	71-96	38-58	22-40	3-19
Urban land------	0-6	Variable---------	---	---	---	---	---	---	---	---	---
Pt*-------------- Pits	0-60	Variable---------	---	---	---	---	---	---	---	---	---
RaA-------------- Rains	0-6	Sandy loam-------	SM, ML	A-2, A-4	0	100	95-100	50-85	25-56	<35	NP-10
	6-60	Sandy clay loam, clay loam, sandy clay.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	55-98	30-70	18-40	4-20
RbA*:											
Rains-----------	0-11	Fine sandy loam	SM, ML, SC, CL	A-2-4, A-4	0	95-100	92-100	50-95	30-60	<30	NP-10
	11-55	Sandy clay loam, clay loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	98-100	95-100	55-98	30-70	18-40	4-20
	55-72	Sandy clay loam, clay loam, sandy clay.	SC, SC-SM, CL, CL-ML	A-4, A-6, A-7	0	98-100	95-100	60-98	36-72	18-45	4-28
Bethera---------	0-6	Fine sandy loam	SM, ML, SC-SM, CL-ML	A-4	0	100	98-100	70-85	40-55	<26	NP-6
	6-72	Clay, clay loam, sandy clay.	CL, CH, ML, MH	A-6, A-7	0	100	98-100	93-100	55-95	37-55	12-30
SeC2------------- Searcy	0-3	Sandy clay loam	CL, ML, SC-SM	A-4, A-6	0	95-100	95-100	80-95	50-75	22-38	3-16
	3-8	Clay loam, sandy clay loam, clay.	CL, SC	A-6, A-4	0	95-100	95-100	80-100	36-70	30-40	11-17
	8-37	Clay, sandy clay	CH, SC	A-7	0	95-100	95-100	90-100	60-75	41-50	15-22
	37-65	Clay, sandy clay, silty clay.	CH, SC	A-7	0	95-100	95-100	90-100	60-90	45-60	20-35
SeD3------------- Searcy	0-5	Sandy clay loam	CL, ML, SC-SM	A-4, A-6	0	95-100	95-100	80-95	50-75	22-38	3-16
	5-44	Clay, sandy clay	CH, SC	A-7	0	95-100	95-100	90-100	60-75	41-50	15-22
	44-65	Clay, sandy clay, silty clay.	CH, SC	A-7	0	95-100	95-100	90-100	60-90	45-60	20-35
SmD-------------- Smithdale	0-11	Sandy loam-------	SM, SC-SM	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	11-41	Clay loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	41-72	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
SuD2------------- Sumter	0-7	Silty clay-------	CL	A-7, A-6	0	90-100	85-100	80-98	75-90	35-50	16-25
	7-26	Silty clay, clay, silty clay loam.	CH, CL	A-7, A-6	0	85-100	78-98	75-95	75-95	35-55	16-32
	26-30	Silty clay loam, silty clay, clay.	CH, CL	A-6, A-7	0	80-100	65-98	60-95	55-95	35-55	16-32
	30-60	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
TaD*:											
Troup-----------	0-50	Loamy sand-------	SM, SP-SM	A-2, A-4	0	95-100	90-100	50-90	10-40	<20	NP
	50-66	Sandy clay loam, sandy loam, fine sandy loam.	SC, SC-SM, CL-ML, CL	A-4, A-2, A-6	0	95-100	90-100	60-90	24-55	19-40	4-20
Alaga-----------	0-4	Loamy sand-------	SM, SW-SM, SP-SM	A-2, A-1-B	0	100	100	40-80	10-35	<25	NP-4
	4-96	Loamy sand, loamy fine sand, sand.	SM, SW-SM, SP-SM	A-2	0	100	100	50-85	10-35	<25	NP-4
TsF*:											
Troup-----------	0-56	Loamy sand-------	SM, SP-SM	A-2, A-4	0	95-100	90-100	50-90	10-40	<20	NP
	56-68	Sandy clay loam, sandy loam, fine sandy loam.	SC, SC-SM, CL-ML, CL	A-4, A-2, A-6	0	95-100	90-100	60-90	24-55	19-40	4-20
Luverne---------	0-4	Sandy loam-------	ML, SM	A-4, A-2	0-5	87-100	84-100	80-100	30-60	<20	NP
	4-23	Clay loam, sandy clay, clay.	ML, MH	A-5, A-7, A-4	0-5	95-100	90-100	85-100	50-95	38-70	8-30
	23-45	Clay loam, sandy clay loam.	ML, MH, SM	A-4, A-5, A-7	0-5	95-100	85-100	85-100	36-76	32-56	2-14
	45-60	Stratified loamy sand to sandy clay loam.	SM, ML	A-4, A-6, A-2, A-7	0-5	90-100	85-100	70-100	25-65	28-49	3-16
Smithdale-------	0-8	Sandy loam-------	SM, SC-SM	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	8-42	Clay loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	42-60	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
UdC, UdF--------- Udorthents	0-80	Variable---------	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 16.--Physical and Chemical Properties of the Soils

(The symbol < means less than; > means more than. 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)

Soil name and map symbol	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/cc	In/hr	In/in	pH				Pct
AaB*:										
Alaga	0-6	2-12	1.60-1.75	6.0-20	0.05-0.09	3.6-6.0	Low	0.10	5	.5-3
	6-96	2-12	1.60-1.75	6.0-20	0.05-0.09	3.6-6.0	Low	0.10		
Troup	0-62	2-12	1.30-1.70	6.0-20	0.08-0.12	4.5-5.5	Low	0.10	5	<1
	62-80	15-35	1.40-1.60	0.6-2.0	0.10-0.13	4.5-5.5	Low	0.20		
ArC	0-6	7-20	1.35-1.65	0.6-2.0	0.11-0.15	3.6-5.5	Low	0.28	3	.5-1
Arundel	6-23	35-78	1.55-1.65	<0.06	0.12-0.18	3.6-5.5	High	0.32		
	23-60	---	---	0.01-0.06	---	---	---	---		
ArF	0-6	7-20	1.35-1.65	0.6-2.0	0.11-0.15	3.6-5.5	Low	0.28	3	.5-1
Arundel	6-24	35-78	1.55-1.65	<0.06	0.12-0.18	3.6-5.5	High	0.32		
	24-60	---	---	0.01-0.06	---	---	---	---		
BeB	0-12	6-14	1.45-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.20	5	1-3
Benndale	12-42	10-18	1.55-1.65	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.28		
	42-66	14-28	1.55-1.65	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.32		
BgB	0-10	4-10	1.40-1.50	6.0-20	0.05-0.10	4.5-6.0	Low	0.10	5	.5-2
Bigbee	10-80	1-10	1.40-1.50	6.0-20	0.05-0.08	4.5-6.0	Low	0.17		
BoB	0-23	5-15	1.30-1.70	6.0-20	0.05-0.11	4.5-6.0	Low	0.10	5	.5-2
Bonneau	23-72	15-40	1.40-1.60	0.6-2.0	0.10-0.16	4.5-5.5	Low	0.20		
BoC	0-26	5-15	1.30-1.70	6.0-20	0.05-0.11	4.5-6.0	Low	0.10	5	.5-2
Bonneau	26-72	15-40	1.40-1.60	0.6-2.0	0.10-0.16	4.5-5.5	Low	0.20		
CaA	0-18	7-17	1.35-1.60	2.0-6.0	0.10-0.14	4.5-6.0	Low	0.24	5	.5-2
Cahaba	18-48	18-35	1.35-1.60	0.6-2.0	0.12-0.20	4.5-6.0	Low	0.28		
	48-60	4-20	1.40-1.70	2.0-20	0.05-0.10	4.5-6.0	Low	0.24		
CoA	0-8	10-25	1.20-1.40	0.6-2.0	0.12-0.20	5.1-7.3	Low	0.37	5	1-4
Congaree	8-58	18-35	1.20-1.50	0.6-2.0	0.12-0.20	5.1-7.3	Low	0.37		
	58-65	---	---	---	---	---	---	---		
DbF*:										
Demopolis	0-4	18-33	1.30-1.60	0.2-0.6	0.10-0.16	7.4-8.4	Moderate	0.24	2	1-2
	4-10	18-33	1.40-1.65	0.2-0.6	0.10-0.16	7.4-8.4	Low	0.24		
	10-60	---	---	0.00-0.01	---	---	---	---		
Brantley	0-6	8-21	1.35-1.65	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.28	5	1-4
	6-36	35-55	1.35-1.55	0.06-0.2	0.12-0.20	4.5-5.5	Moderate	0.28		
	36-56	25-35	1.35-1.65	0.6-2.0	0.12-0.20	4.5-5.5	Low	0.24		
	56-72	10-25	1.40-1.65	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.20		
DwD*:										
Demopolis	0-4	17-35	1.35-1.60	0.2-0.6	0.10-0.16	7.4-8.4	Moderate	0.37	2	1-2
	4-10	20-35	1.40-1.65	0.2-0.6	0.10-0.16	7.4-8.4	Low	0.32		
	10-60	---	---	0.00-0.01	---	---	---	---		
Watsonia	0-4	40-70	1.10-1.40	<0.06	0.12-0.16	4.5-6.5	High	0.32	2	2-5
	4-16	60-80	1.00-1.40	<0.06	0.12-0.16	4.5-6.5	High	0.32		
	16-19	50-70	1.00-1.40	<0.06	0.12-0.16	6.1-8.4	High	0.37		
	19-60	---	---	0.00-0.01	---	---	---	---		

See footnote at end of table.

Table 16.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	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/cc	In/hr	In/in	pH				Pct
EuA-------------- Eunola	0-8	10-20	1.35-1.65	2.0-6.0	0.10-0.14	4.5-5.5	Low----------	0.20	5	.5-2
	8-44	18-35	1.35-1.65	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.28		
	44-54	8-25	1.35-1.65	2.0-6.0	0.10-0.16	4.5-5.5	Low----------	0.24		
	54-62	2-11	1.45-1.75	6.0-20	0.02-0.06	4.5-5.5	Low----------	0.20		
GrB-------------- Greenville	0-8	5-20	1.30-1.65	0.6-6.0	0.07-0.14	4.5-6.0	Low----------	0.24	5	.5-2
	8-72	35-55	1.35-1.55	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.17		
GsC2------------- Greenville	0-5	15-30	1.30-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.24	5	1-3
	5-80	35-55	1.35-1.55	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.17		
GtD3------------- Greenville	0-3	15-30	1.30-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.24	5	1-3
	3-72	35-55	1.35-1.55	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.17		
HaB-------------- Halso	0-3	9-35	1.25-1.55	0.6-2.0	0.14-0.20	3.6-5.5	Low----------	0.32	4	.5-2
	3-5	35-70	1.20-1.50	0.06-0.2	0.12-0.18	3.6-5.5	Moderate-----	0.32		
	5-33	40-70	1.10-1.40	<0.06	0.12-0.18	3.6-5.5	High---------	0.32		
	33-48	25-65	1.30-1.65	<0.06	0.12-0.18	3.6-5.5	Moderate-----	0.24		
	48-60	---	---	<0.06	---	---	-------------	----		
HbC-------------- Halso	0-4	6-20	1.30-1.60	0.6-2.0	0.11-0.15	3.6-5.5	Low----------	0.28	4	.5-2
	4-44	40-70	1.10-1.40	<0.06	0.12-0.18	3.6-5.5	High---------	0.32		
	44-60	---	---	<0.06	---	---	-------------	----		
LeA-------------- Leeper	0-3	27-35	1.45-1.60	0.06-0.2	0.18-0.22	6.1-8.4	High---------	0.32	5	1-4
	3-60	35-50	1.40-1.60	<0.06	0.18-0.20	6.1-8.4	High---------	0.32		
LfB-------------- Lucedale	0-8	1-10	1.40-1.55	0.6-2.0	0.15-0.20	5.1-6.5	Low----------	0.24	5	.5-2
	8-72	20-30	1.55-1.70	0.6-2.0	0.14-0.18	4.5-5.5	Low----------	0.24		
LgB-------------- Lucy	0-33	1-12	1.30-1.70	6.0-20	0.08-0.12	5.1-6.0	Low----------	0.10	5	.5-1
	33-38	10-30	1.40-1.60	2.0-6.0	0.10-0.12	4.5-5.5	Low----------	0.24		
	38-60	15-35	1.40-1.60	0.6-2.0	0.12-0.14	4.5-5.5	Low----------	0.28		
LuB-------------- Luverne	0-8	7-20	1.35-1.65	2.0-6.0	0.11-0.15	3.6-5.5	Low----------	0.24	5	.5-1
	8-42	35-50	1.25-1.55	0.2-0.6	0.12-0.18	3.6-5.5	Moderate-----	0.28		
	42-60	10-35	1.35-1.65	0.2-0.6	0.05-0.10	3.6-5.5	Low----------	0.28		
LuC-------------- Luverne	0-11	7-20	1.35-1.65	2.0-6.0	0.11-0.15	3.6-5.5	Low----------	0.24	5	.5-1
	11-40	35-50	1.25-1.55	0.2-0.6	0.12-0.18	3.6-5.5	Moderate-----	0.28		
	40-60	10-35	1.35-1.65	0.2-0.6	0.05-0.10	3.6-5.5	Low----------	0.28		
LuE-------------- Luverne	0-13	7-20	1.35-1.65	2.0-6.0	0.11-0.15	3.6-5.5	Low----------	0.24	5	.5-1
	13-40	35-50	1.25-1.55	0.2-0.6	0.12-0.18	3.6-5.5	Moderate-----	0.28		
	40-60	10-35	1.35-1.65	0.2-0.6	0.05-0.10	3.6-5.5	Low----------	0.28		
LvC*:										
Luverne---------	0-11	7-20	1.35-1.65	2.0-6.0	0.11-0.15	3.6-5.5	Low----------	0.24	5	.5-1
	11-40	35-50	1.25-1.55	0.2-0.6	0.12-0.18	3.6-5.5	Moderate-----	0.28		
	40-60	10-35	1.35-1.65	0.2-0.6	0.05-0.10	3.6-5.5	Low----------	0.28		
Urban land------	0-6	---	---	---	---	---	-------------	----	---	---
LyA-------------- Lynchburg	0-11	5-20	1.30-1.60	2.0-6.0	0.09-0.13	3.6-5.5	Low----------	0.20	5	.5-5
	11-65	18-35	1.30-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.20		
MaB-------------- Macon	0-13	7-20	1.40-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Low----------	0.28	5	.5-2
	13-38	18-35	1.40-1.60	0.2-0.6	0.12-0.17	4.5-6.0	Moderate-----	0.28		
	38-72	25-50	1.20-1.40	0.06-0.2	0.11-0.16	4.5-6.0	Moderate-----	0.24		

See footnote at end of table.

Table 16.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	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/cc	In/hr	In/in	pH				Pct
MbB-------------- Malbis	0-9	10-25	1.30-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.24	5	.5-1
	9-34	18-33	1.30-1.70	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.28		
	34-72	20-35	1.45-1.70	0.2-0.6	0.06-0.12	4.5-5.5	Low----------	0.28		
MbC-------------- Malbis	0-6	10-25	1.30-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.24	5	.5-1
	6-30	18-33	1.30-1.70	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.28		
	30-72	20-35	1.45-1.70	0.2-0.6	0.06-0.12	4.5-5.5	Low----------	0.28		
MIA*:										
Mantachie-------	0-3	8-20	1.50-1.60	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.28	5	1-3
	3-60	18-34	1.50-1.60	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.28		
Bibb------------	0-16	2-18	1.40-1.65	0.6-2.0	0.15-0.20	3.6-5.5	Low----------	0.28	5	1-3
	16-60	2-18	1.45-1.75	0.6-2.0	0.10-0.20	3.6-5.5	Low----------	0.37		
Iuka------------	0-5	6-15	---	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.37	5	.5-2
	5-48	8-18	---	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.28		
	48-60	5-15	---	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.20		
OkC2------------- Oktibbeha	0-4	40-60	1.10-1.40	0.00-0.06	0.12-0.16	4.5-6.0	High---------	0.32	5	2-7
	4-26	60-80	1.00-1.30	0.00-0.06	0.12-0.16	4.5-6.0	Very high----	0.32		
	26-40	60-80	1.00-1.30	0.00-0.06	0.12-0.16	4.5-6.0	Very high----	0.32		
	40-60	50-70	1.10-1.40	0.00-0.06	0.05-0.10	6.6-8.4	Very high----	0.32		
OrB-------------- Orangeburg	0-13	7-15	1.30-1.50	2.0-6.0	0.07-0.10	4.5-5.5	Low----------	0.20	5	.5-2
	13-75	18-35	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
OrC-------------- Orangeburg	0-8	7-15	1.30-1.50	2.0-6.0	0.07-0.10	4.5-5.5	Low----------	0.20	5	.5-2
	8-72	18-35	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
OuC*:										
Orangeburg------	0-6	7-15	1.30-1.50	2.0-6.0	0.07-0.10	4.5-5.5	Low----------	0.20	5	.5-2
	6-72	18-35	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
Urban land------	0-6	---	---	---	---	---	-------------	----	---	---
Pt*-------------- Pits	0-60	---	---	---	---	---	-------------	----	---	---
RaA-------------- Rains	0-6	5-20	1.30-1.60	2.0-6.0	0.10-0.14	3.6-5.5	Low----------	0.20	5	1-6
	6-60	18-40	1.30-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.24		
RbA*:										
Rains-----------	0-11	5-20	1.30-1.60	2.0-6.0	0.08-0.12	3.6-5.5	Low----------	0.24	5	1-6
	11-55	18-35	1.30-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.24		
	55-72	18-40	1.30-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.24		
Bethera---------	0-6	5-20	1.30-1.50	0.6-2.0	0.11-0.16	3.6-6.0	Low----------	0.24	5	1-6
	6-72	35-50	1.10-1.50	0.06-0.6	0.14-0.18	3.6-6.0	Moderate-----	0.32		
SeC2------------- Searcy	0-3	18-35	1.35-1.60	0.2-0.6	0.12-0.18	3.6-6.0	Moderate-----	0.24	5	1-4
	3-8	25-45	1.35-1.60	0.2-0.6	0.12-0.18	3.6-6.0	Moderate-----	0.24		
	8-37	40-55	1.40-1.65	0.06-0.2	0.12-0.20	3.6-6.0	Moderate-----	0.28		
	37-65	45-60	1.40-1.65	0.06-0.2	0.12-0.20	3.6-6.0	High---------	0.28		
SeD3------------- Searcy	0-5	18-35	1.35-1.60	0.2-0.6	0.12-0.18	3.6-6.0	Moderate-----	0.24	5	1-4
	5-44	40-55	1.40-1.65	0.06-0.2	0.12-0.20	3.6-6.0	Moderate-----	0.28		
	44-65	45-60	1.40-1.65	0.06-0.2	0.12-0.20	3.6-6.0	High---------	0.28		

See footnote at end of table.

Table 16.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	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/cc	In/hr	In/in	pH				Pct
SmD-------------- Smithdale	0-11	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	11-41	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	41-72	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
SuD2------------- Sumter	0-7	32-50	1.30-1.60	0.06-2.0	0.12-0.17	6.6-8.4	High---------	0.37	2	2-5
	7-26	35-57	1.15-1.55	0.06-2.0	0.12-0.17	7.4-8.4	High---------	0.37		
	26-30	35-57	1.15-1.50	0.06-2.0	0.11-0.16	7.4-8.4	Moderate-----	0.32		
	30-60	---	---	0.00-0.01	---	---	-------------	----		
TaD*:										
Troup-----------	0-50	2-12	1.30-1.70	6.0-20	0.08-0.12	4.5-5.5	Low----------	0.10	5	<1
	50-66	15-35	1.40-1.60	0.6-2.0	0.10-0.13	4.5-5.5	Low----------	0.20		
Alaga-----------	0-4	2-12	1.60-1.75	6.0-20	0.05-0.09	3.6-6.0	Low----------	0.10	5	.5-3
	4-96	2-12	1.60-1.75	6.0-20	0.05-0.09	3.6-6.0	Low----------	0.10		
TsF*:										
Troup-----------	0-56	2-12	1.30-1.70	6.0-20	0.08-0.12	4.5-5.5	Low----------	0.10	5	<1
	56-68	15-35	1.40-1.60	0.6-2.0	0.10-0.13	4.5-5.5	Low----------	0.20		
Luverne---------	0-4	7-20	1.35-1.65	2.0-6.0	0.11-0.15	3.6-5.5	Low----------	0.24	5	.5-1
	4-23	35-50	1.25-1.55	0.2-0.6	0.12-0.18	3.6-5.5	Moderate-----	0.28		
	23-45	20-40	1.35-1.65	0.2-0.6	0.12-0.18	3.6-5.5	Low----------	0.28		
	45-60	10-35	1.35-1.65	0.2-0.6	0.05-0.10	3.6-5.5	Low----------	0.28		
Smithdale-------	0-8	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	8-42	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	42-60	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
UdC, UdF--------- Udorthents	0-80	---	---	---	---	3.6-5.5	Low----------	----	5	<.5

* 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 "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	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			
AaB*:											
Alaga	A	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
Troup	A	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
ArC, ArF Arundel	C	None	---	---	>6.0	---	---	20-40	Soft	High	High.
BeB Benndale	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
BgB Bigbee	A	Rare	---	---	3.5-6.0	Apparent	Dec-Mar	>60	---	Low	Moderate.
BoB, BoC Bonneau	A	None	---	---	3.5-5.0	Perched	Dec-Mar	>60	---	Low	High.
CaA Cahaba	B	Rare	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
CoA Congaree	B	Frequent	Brief	Dec-Apr	2.5-4.0	Apparent	Dec-Apr	>60	---	Moderate	Moderate.
DbF*:											
Demopolis	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	Low.
Brantley	C	None	---	---	>6.0	---	---	>60	---	High	High.
DwD*:											
Demopolis	C	One	---	---	>6.0	---	---	10-20	Soft	Moderate	Low.
Watsonia	D	One	---	---	>6.0	---	---	10-20	Soft	High	High.
EuA Eunola	C	Rare	---	---	1.5-2.5	Apparent	Dec-Mar	>60	---	Low	High.
GrB, GsC2, GtD3 Greenville	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
HaB, HbC Halso	D	None	---	---	>6.0	---	---	40-60	Soft	High	High.
LeA Leeper	D	Frequent	Brief	Dec-Apr	1.0-2.0	Perched	Dec-Apr	>60	---	High	Low.
LfB Lucedale	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
LgB Lucy	A	None	---	---	>6.0	---	---	>60	---	Low	High.
LuB, LuC, LuE Luverne	C	None	---	---	>6.0	---	---	>60	---	High	High.
LvC*:											
Luverne	C	None	---	---	>6.0	---	---	>60	---	High	High.

See footnote at end of table.

Table 17.--Soil and Water Features--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hard-ness	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In			
LvC*:											
Urban land-------	-	None--------	---	---	>2.0	---	---	>60	---	---	---
LyA--------------- Lynchburg	C	None--------	---	---	0.5-1.5	Apparent	Dec-Apr	>60	---	High-----	High.
MaB--------------- Macon	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
MbB, MbC---------- Malbis	B	None--------	---	---	2.5-4.0	Perched	Dec-Mar	>60	---	Moderate	Moderate.
MIA*:											
Mantachie--------	C	Frequent----	Brief-----	Dec-Apr	1.0-1.5	Apparent	Dec-Apr	>60	---	High-----	High.
Bibb-------------	D	Frequent----	Brief-----	Dec-Apr	0.5-1.0	Apparent	Dec-Apr	>60	---	High-----	Moderate.
Iuka-------------	C	Frequent----	Brief-----	Dec-Apr	1.0-3.0	Apparent	Dec-Apr	>60	---	Moderate	High.
OkC2-------------- Oktibbeha	D	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
OrB, OrC---------- Orangeburg	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
OuC*:											
Orangeburg-------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Urban land-------	-	None--------	---	---	>2.0	---	---	>10	---	---	---
Pt*--------------- Pits	-	None--------	---	---	>6.0	---	---	>60	---	---	---
RaA--------------- Rains	D	None--------	---	---	0-1.0	Apparent	Dec-Apr	>60	---	High-----	High.
RbA*:											
Rains------------	D	Occasional	Brief-----	Dec-Apr	0-1.0	Apparent	Dec-Apr	>60	---	High-----	High.
Bethera----------	D	Occasional	Brief-----	Dec-Apr	0-1.5	Apparent	Dec-Apr	>60	---	High-----	High.
SeC2, SeD3-------- Searcy	C	None--------	---	---	2.0-3.5	Perched	Dec-Mar	>60	---	High-----	High.
SmD--------------- Smithdale	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
SuD2-------------- Sumter	C	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	Low.
TaD*:											
Troup------------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Alaga------------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
TsF*:											
Troup------------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Luverne----------	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.

See footnote at end of table.

Table 17.--Soil and Water Features--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hard-ness	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In			
TsF*:											
Smithdale--------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
UdC, UdF---------- Udorthents	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 18.--Physical Analyses of Selected Soils

Soil name and sample number	Depth	Horizon	Particle-size distribution (Percent less than 2.0 mm) Sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)
	In				
Greenville [1]:					
(S83AL-013-6)	0-8	Ap	66.9	17.6	15.5
	8-22	Bt1	43.2	20.0	36.8
	22-54	Bt2	40.6	11.0	48.4
	54-74	Bt3	41.8	11.6	46.6
Halso [2]:					
(S83AL-013-1)	0-2	A	41.1	26.2	32.7
	2-5	Bt1	23.9	25.5	50.6
	5-16	Bt2	4.6	31.5	63.9
	16-31	Bt3	3.2	33.2	63.6
	31-41	B/C	2.3	36.7	61.0
	41-49	C/B	1.1	34.2	64.7
	49-60	Cr	---	---	---
Halso [1]:					
(S83AL-013-3)	0-3	A	37.4	56.2	6.4
	3-5	BA	---	---	---
	5-13	Bt1	9.9	31.1	59.0
	13-25	Bt2	13.4	36.1	50.5
	25-33	Bt3	16.4	40.1	43.5
	33-48	C/B	18.9	50.2	30.9
	48-60	Cr	---	---	---
Lucedale [3]:					
(S83AL-013-4)	0-8	Ap	73.7	20.7	5.6
	8-48	Bt1	44.5	32.1	23.4
	48-62	Bt2	51.7	18.5	29.8
Luverne [1]:					
(S86AL-013-5)	0-4	Ap	66.4	26.1	7.5
	4-11	E	67.5	21.9	10.6
	11-23	Bt1	32.8	18.0	49.2
	23-28	Bt2	45.3	16.6	38.1
	28-32	Bt3	29.4	26.9	43.7
	32-40	Bt4	44.7	20.7	34.6
	40-60	C	57.0	18.7	24.3
Malbis [4]:					
(S83AL-013-10)	0-8	Ap	79.1	9.4	11.5
	8-40	Bt	53.9	25.8	20.3
	40-50	Btv1	59.5	20.1	20.4
	50-60	Btv2	56.9	18.6	24.5
	60-72	Btv3	54.9	16.9	28.2
Malbis [1]:					
(S86AL-013-12)	0-6	Ap1	72.2	20.4	7.4
	6-9	Ap2	78.9	14.8	6.3
	9-22	Bt1	56.4	22.1	21.5
	22-34	Bt2	55.2	19.9	24.9
	34-40	Btv1	57.6	17.7	24.7
	40-47	Btv2	57.8	16.5	25.7
	47-58	Btv3	56.0	15.5	28.5
	58-72	Btv4	54.6	15.0	30.4
Oktibbeha [1]:					
(S86AL-013-8)	0-4	Ap	24.2	18.7	57.1
	4-12	Bt1	13.4	12.2	74.4
	12-26	Bt2	10.8	13.2	76.0
	26-40	Btss	10.7	13.6	75.7
	40-60	2C	15.0	45.8	39.2

See footnotes at end of table.

Table 18.--Physical Analyses of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution (Percent less than 2.0 mm) Sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)
	In				
Orangeburg [5]:					
(S83AL-013-23)	0-12	Ap	77.1	17.4	5.5
	12-40	Bt1	56.2	16.3	27.5
	40-80	Bt2	59.1	9.5	31.4
Searcy [1]:					
(S89AL-013-9)	0-3	Ap	56.5	16.9	26.6
	3-8	Bt1	29.9	16.2	53.9
	8-18	Bt2	29.3	15.4	55.3
	18-31	Bt3	38.3	18.1	43.6
	31-37	Bt4	39.6	18.0	42.4
	37-55	2Bt5	18.5	23.7	57.8
	55-65	2Bt6	11.7	27.5	60.8

[1] This is the typical pedon for the series in Butler County. For the description and location of the pedon, see the section "Soil Series and Their Morphology."

[2] This pedon is in an area of Halso fine sandy loam, 3 to 8 percent slopes. It is not the typical pedon for the map unit. It is about 1,050 feet east and 1,450 feet north of the southwest corner of sec. 8, T. 9 N., R. 12 E.

[3] This pedon is in an area of Lucedale sandy loam, 1 to 3 percent slopes. It is not the typical pedon for the map unit. It is about 750 feet south and 375 feet west of the northeast corner of sec. 20, T. 10 N., R. 12 E.

[4] This pedon is in an area of Malbis fine sandy loam, 1 to 3 percent slopes. It is not the typical pedon for the map unit. It is about 2,400 feet east and 1,680 feet north of the southwest corner of sec. 19, T. 8 N., R. 14 E.

[5] This pedon is in an area of Orangeburg fine sandy loam, 1 to 5 percent slopes. It is not the typical pedon for the map unit. It is about 2,100 feet west and 1,080 feet north of the southeast corner of sec. 29, T. 7 N., R. 13 E.

Table 19.--Chemical Analyses of Selected Soils

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	K	Mg	Na	Extract-able acidity	Cation-exchange capacity	Base saturation	Reaction
	In		Meq/100g				Meq/100g	Meq/100g	Pct	pH
Greenville [1]:										
(S83AL-013-6)	0-8	Ap	2.10	0.16	0.95	---	2.80	6.01	53.5	5.6
	8-22	Bt1	2.10	0.04	1.01	---	4.07	7.22	43.7	5.5
	22-54	Bt2	0.40	0.03	0.88	---	4.32	5.63	23.3	5.1
	54-74	Bt3	0.25	0.03	0.47	---	4.26	5.01	15.0	5.1
Halso [2]:										
(S83AL-013-1)	0-2	Ap	3.73	0.27	3.40	---	8.00	15.40	48.1	4.5
	2-5	Bt1	4.62	0.30	5.00	---	10.80	20.72	47.9	4.5
	5-16	Bt2	3.33	0.40	4.89	---	26.96	35.58	24.3	4.5
	16-31	Bt3	2.50	0.45	5.36	---	30.72	39.03	21.3	4.4
	31-41	B/C	2.18	0.52	5.27	---	30.32	38.29	20.8	4.4
	41-49	C/B	2.38	0.69	6.53	---	30.88	40.48	23.7	4.4
	49-60	Cr	---	---	---	---	---	---	---	---
Halso [1]:										
(S83AL-013-3)	0-3	A	0.93	0.11	1.04	---	5.28	7.36	28.3	4.9
	3-5	BA	---	---	---	---	---	---	---	---
	5-13	Bt1	2.83	0.26	4.95	---	24.40	32.44	24.8	4.6
	13-25	Bt2	2.35	0.26	4.95	---	27.04	34.60	21.8	4.4
	25-33	Bt3	2.48	0.33	5.29	---	31.12	39.22	20.7	4.3
	33-48	C/B	2.28	0.23	4.63	---	20.80	27.94	25.6	4.2
	48-60	Cr	---	---	---	---	---	---	---	---
Lucedale [3]:										
(S83AL-013-4)	0-8	Ap	1.38	0.14	0.54	---	1.52	3.58	57.5	5.6
	8-48	Bt1	2.73	0.11	0.79	---	2.96	6.59	55.1	5.4
	48-62	Bt2	1.25	0.07	1.85	---	3.20	6.37	49.8	5.4
Luverne [1]:										
(S86AL-013-5)	0-4	Ap	0.51	0.15	0.22	0.24	1.87	4.4	37.5	5.0
	4-11	E	0.22	0.15	0.57	0.37	2.16	4.5	37.8	5.1
	11-23	Bt1	0.09	0.46	3.37	0.24	11.94	19.2	25.8	4.9
	23-28	Bt2	0.09	0.40	2.81	0.42	11.88	18.2	23.9	4.6
	28-32	Bt3	0.11	0.57	3.51	0.37	16.43	19.3	21.7	4.5
	32-40	Bt4	0.06	0.37	2.33	0.35	13.54	18.4	18.7	4.7
	40-60	C	0.04	0.38	2.35	0.33	12.57	18.3	---	4.6
Malbis [4]:										
(S83AL-013-10)	0-8	Ap	2.98	0.16	0.54	---	0.64	4.32	85.2	6.6
	8-40	Bt	0.88	0.15	0.48	---	5.12	6.63	22.7	4.8
	40-50	Btv1	1.08	0.04	0.32	---	4.24	5.68	25.3	4.9
	50-60	Btv2	0.60	0.03	0.24	---	4.16	5.04	17.4	4.7
	60-72	Btv3	0.58	0.03	0.32	---	4.40	5.33	17.5	4.7
Malbis [1]:										
(S86AL-013-12)	0-6	Ap1	2.94	0.31	0.71	0.30	0.10	4.4	97.7	6.4
	6-9	Ap2	2.53	0.15	0.43	0.30	TR	3.0	100.0	6.8
	9-22	Bt1	1.56	0.08	0.71	0.23	0.37	3.9	87.5	5.5
	22-34	Bt2	1.27	0.07	0.39	0.24	1.33	4.5	59.7	5.0
	34-40	Btv1	0.62	0.06	0.67	0.19	1.64	3.9	48.4	5.1
	40-47	Btv2	0.23	0.05	0.42	0.26	2.03	4.2	32.1	5.5
	47-58	Btv3	0.20	0.06	0.28	0.26	2.41	4.5	24.9	5.2
	58-72	Btv4	0.25	0.05	0.33	0.21	2.99	5.0	21.9	5.0
Oktibbeha [1]:										
(S86AL-013-8)	0-4	Ap	41.64	0.64	2.11	0.28	0.05	39.8	99.9	6.9
	4-12	Bt1	23.11	0.68	4.91	0.42	7.53	43.0	79.5	4.6
	12-26	Bt2	25.97	0.68	5.05	0.61	8.90	46.8	78.4	4.7
	26-40	Btss	29.00	0.67	5.12	0.80	6.22	47.0	85.1	4.5
	40-60	C	60.70	0.73	4.98	0.90	0.08	35.5	99.9	7.7

See footnotes at end of table.

Table 19.--Chemical Analyses of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	Extractable bases				Extract- able acidity	Cation- exchange capacity	Base saturation	Reaction
			Ca	K	Mg	Na				
	In		Meq/100g				Meq/100g	Meq/100g	Pct	pH
Orangeburg [5]:										
(S83AL-013-23)	0-12	Ap	1.05	0.19	0.29	---	1.76	3.28	46.4	5.5
	12-40	Bt1	1.48	0.08	0.95	---	3.36	5.87	42.7	5.1
	40-80	Bt2	0.40	0.03	0.31	---	3.76	4.50	16.5	5.1
Searcy [1]:										
(S89AL-013-9)	0-3	Ap	4.65	0.19	1.72	0.25	1.84	12.71	66	5.2
	3-8	Bt1	6.32	0.27	2.11	0.30	8.63	24.19	48	5.0
	8-18	Bt2	5.03	0.28	1.82	0.34	12.47	25.48	37	5.1
	18-31	Bt3	6.37	0.35	2.37	0.37	15.12	29.27	43	5.1
	31-37	Bt4	7.92	0.35	2.65	0.41	12.86	30.27	49	4.9
	37-55	2Bt5	13.26	0.49	4.34	0.44	15.04	43.86	62	4.8
	55-65	2Bt6	17.19	0.51	5.29	0.49	11.30	48.21	72	4.3

[1] This is the typical pedon for the series in Butler County. For the description and location of the pedon, see the section "Soil Series and Their Morphology."

[2] This pedon is in an area of Halso fine sandy loam, 3 to 8 percent slopes. It is not the typical pedon for the map unit. It is about 1,050 feet east and 1,450 feet north of the southwest corner of sec. 8, T. 9 N., R. 12 E.

[3] This pedon is in an area of Lucedale sandy loam, 1 to 3 percent slopes. It is not the typical pedon for the map unit. It is about 750 feet south and 375 feet west of the northeast corner of sec. 20, T. 10 N., R. 12 E.

[4] This pedon is in an area of Malbis fine sandy loam, 1 to 3 percent slopes. It is not the typical pedon for the map unit. It is about 2,400 feet east and 1,680 feet north of the southwest corner of sec. 19, T. 8 N., R. 14 E.

[5] This pedon is in an area of Orangeburg fine sandy loam, 1 to 5 percent slopes. It is not the typical pedon for the map unit. It is about 2,100 feet west and 1,080 feet north of the southeast corner of sec. 29, T. 7 N., R. 13 E.

Table 20.--Classification of the Soils

Soil name	Family or higher taxonomic class
Alaga	Thermic, coated Typic Quartzipsamments
Arundel	Clayey, montmorillonitic, thermic Typic Hapludults
Benndale	Coarse-loamy, siliceous, thermic Typic Paleudults
Bethera	Clayey, mixed, thermic Typic Paleaquults
Bibb	Coarse-loamy, siliceous, acid, thermic Typic Fluvaquents
Bigbee	Thermic, coated Typic Quartzipsamments
Bonneau	Loamy, siliceous, thermic Arenic Paleudults
Brantley	Fine, mixed, thermic Ultic Hapludalfs
Cahaba	Fine-loamy, siliceous, thermic Typic Hapludults
Congaree	Fine-loamy, mixed, nonacid, thermic Typic Udifluvents
Demopolis	Loamy, carbonatic, thermic, shallow Typic Udorthents
Eunola	Fine-loamy, siliceous, thermic Aquic Hapludults
Greenville	Clayey, kaolinitic, thermic Rhodic Kandiudults
Halso	Clayey, montmorillonitic, thermic Aquic Hapludults
Iuka	Coarse-loamy, siliceous, acid, thermic Aquic Udifluvents
Leeper	Fine, montmorillonitic, nonacid, thermic Vertic Epiaquepts
Lucedale	Fine-loamy, siliceous, thermic Rhodic Paleudults
Lucy	Loamy, siliceous, thermic Arenic Kandiudults
Luverne	Clayey, mixed, thermic Typic Hapludults
Lynchburg	Fine-loamy, siliceous, thermic Aeric Paleaquults
Macon	Fine-loamy, mixed, thermic Typic Paleudalfs
Malbis	Fine-loamy, siliceous, thermic Plinthic Paleudults
Mantachie	Fine-loamy, siliceous, acid, thermic Aeric Fluvaquents
Oktibbeha	Very-fine, montmorillonitic, thermic Chromic Dystruderts
Orangeburg	Fine-loamy, siliceous, thermic Typic Kandiudults
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Searcy	Fine, mixed, thermic Aquic Paleudalfs
Smithdale	Fine-loamy, siliceous, thermic Typic Hapludults
Sumter	Fine-silty, carbonatic, thermic Rendollic Eutrochrepts
Troup	Loamy, siliceous, thermic Grossarenic Kandiudults
Udorthents	Typic Udorthents
Watsonia	Clayey, montmorillonitic, thermic Leptic Hapluderts

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