United States Department of Agriculture

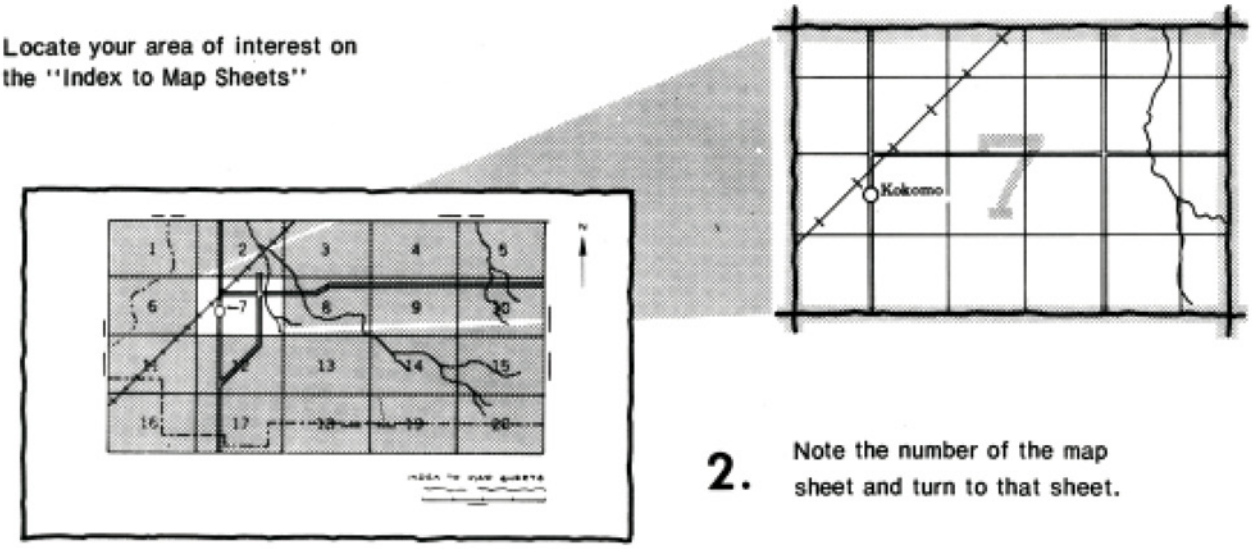
Soil Conservation Service

In cooperation with the Alabama Agricultural Experiment Station, the Alabama Soil and Water Conservation Committee, and United States Department of Agriculture, Forest Service

Soil Survey of Covington County, Alabama

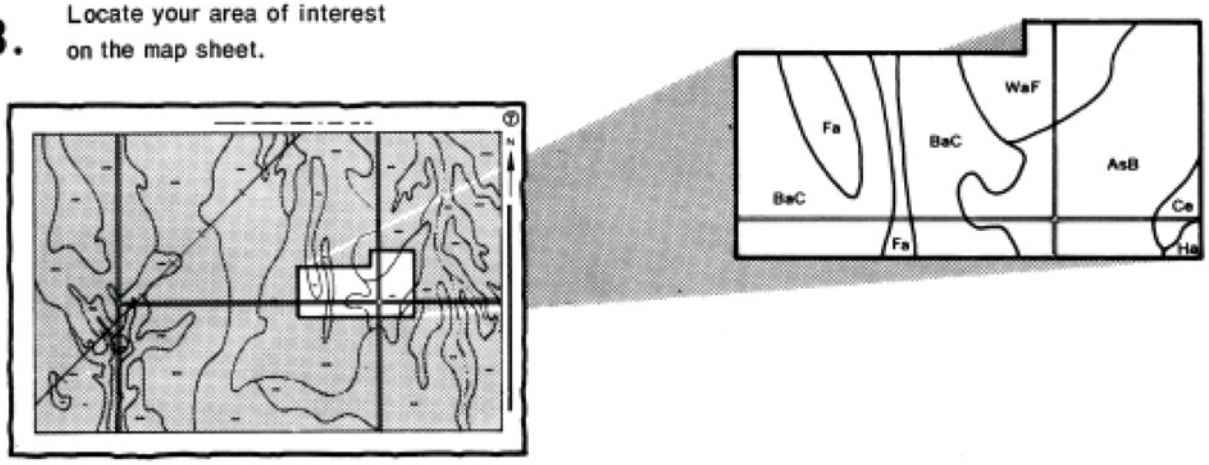
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets"

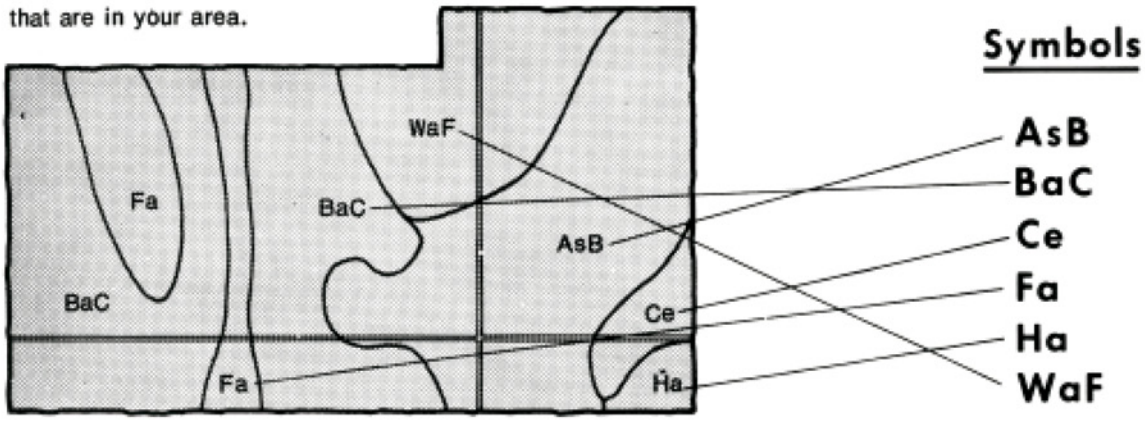


2. Note the number of the map sheet and turn to that sheet.

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

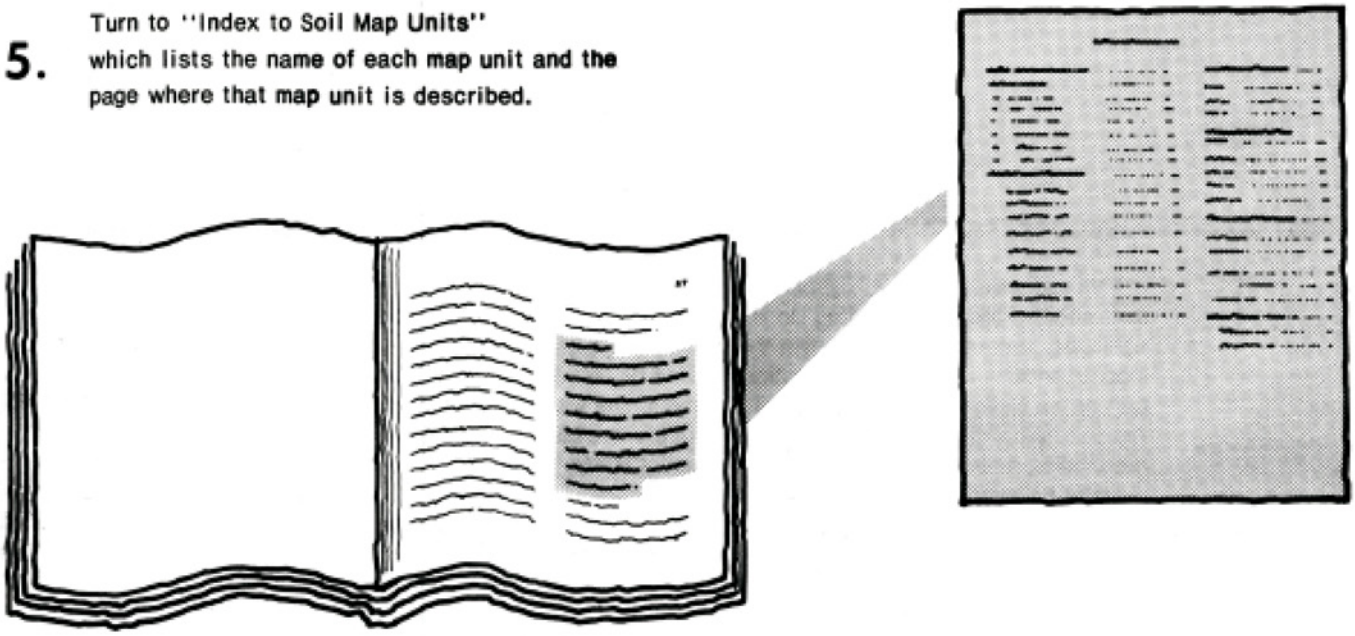


4. List the map unit symbols that are in your area.

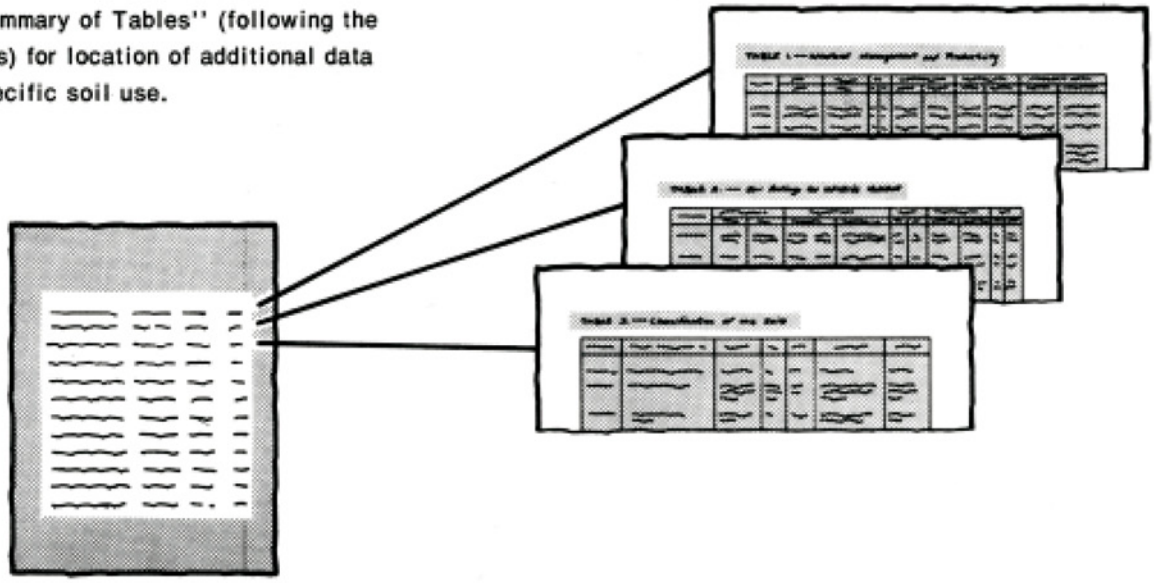


THIS SOIL SURVEY

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



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



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

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1984. Soil names and descriptions were approved in 1985. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1984. This soil survey was made cooperatively by the Soil Conservation Service and the Alabama Agricultural Experiment Station, the Alabama Soil and Water Conservation Committee, and the United States Department of Agriculture, Forest Service. It is part of the technical assistance furnished to the Covington County Soil and Water Conservation District.

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: This soil survey is part of the technical assistance furnished to the Covington County Soil and Water Conservation District.

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Soil Series

Issued February 1989

Index to Map Units

Summary of Tables

Foreword

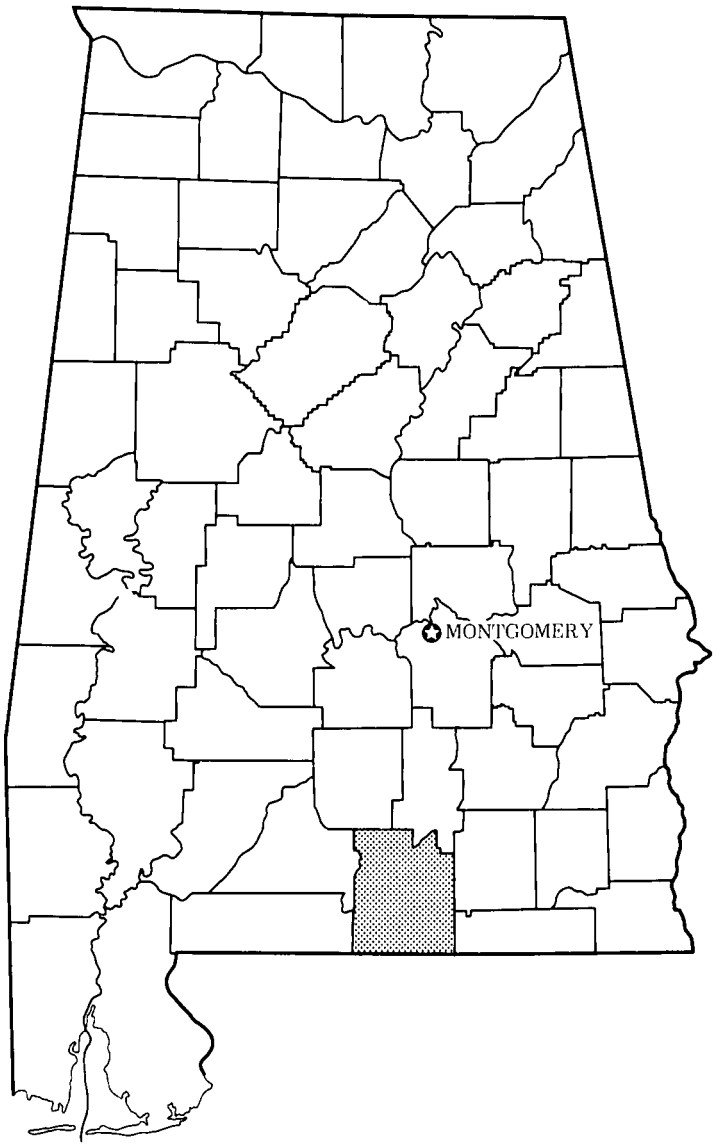
This soil survey contains information that can be used in land-planning programs in Covington County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact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

This soil survey is designed for many different users. Farmers, 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 insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

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

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

Ernest V. Todd
State Conservationist
Soil Conservation Service



Location of Covington County in Alabama.

Soil Survey of Covington County, Alabama

By James A. Cotton, Soil Conservation Service

Fieldwork by James A. Cotton, Richard L. Corley, MacArthur A. Harris, Delaney B. Johnson, and Ralph M. Thornton

United States Department of Agriculture, Soil Conservation Service
In cooperation with the
Alabama Agricultural Experiment Station, the
Alabama Soil and Water Conservation Committee, and the
United States Department of Agriculture, Forest Service

COVINGTON COUNTY is in the south-central part of Alabama. The county has a total land area of 664,315 acres, or 1,038 square miles. It is bounded on the west by Escambia and Conecuh Counties, on the north by Butler and Crenshaw Counties, and on the east by Coffee and Geneva Counties. On the south, Covington County is bounded by Walton and Okaloosa Counties, Florida. According to the latest census, Andalusia, the county seat, has a population of 10,415.

General Nature of the County

This section describes the transportation; natural resources; history and development; physiography, relief, and drainage; geology; and climate of Covington County.

Transportation

Covington County is served by the Alabama and Florida Railroad, which enters the county in the northwestern part, passes through Red Level, River Falls, Andalusia, and Opp, and leaves the county in the east-central part. The Andalusia-Conecuh Railroad operates between Andalusia and Gantt.

U.S. Highway 84 crosses the county from east to west near the center of the county, U.S. Highway 29 crosses from north to south in the central part, and U.S. Highway 331 crosses from north to south in the eastern part. Many state highways and paved county roads provide easy access to most parts of the county.

Charter flights by small aircraft are available at the Andalusia-Opp Municipal Airport and the Florala Municipal Airport.

Natural Resources

Soil is the most important natural resource in the county. Livestock, crops, and timber are marketable products derived from the soil.

Adequate water for municipal, industrial, or irrigation supplies can be obtained throughout the county. Fine or medium grained sand in the Nanfalia Formation or Tallahatta and Hatchetigbee Formations undifferentiated yield 1 million gallons or more daily per well. Fine to coarse sand and limestone in the Oligocene series, Jackson Group, and Lisbon Formation yield 1.5 million gallons daily *(11)*.

Brown iron ore, sand, gravel, and clay are important minerals and rocks.

History and Development

Covington County was named in honor of Brigadier General Leonard Wailes Covington, who was killed in the War of 1812. The area was originally inhabited by the Creek Indians.

According to legend, Andrew Jackson traveled through this area after the War of 1812 from South Carolina enroute to New Orleans and cut three notches on trees to help him find his way back. East Three Notch Street and South Three Notch Street in Andalusia supposedly lie on the famous "Three Notch Trail."

Covington County was formed from a part of Henry County in 1821. At that time, the area of Covington County included several counties, but after Dale and Geneva Counties were formed, it was reduced to its present size. In 1830, the population was 1,522. According to the 1980 census, the population was 36,850.

The county's real growth began in 1899, when the Central of Georgia Railroad established its line from Searight to Andalusia, and the Louisville and Nashville Railroad ran a line from Georgiana, through Andalusia and Opp, to Graceville, Florida. Before the railroads, Covington County had only an agricultural and timber economy.

Covington County had 1,407 farms in 1969 and 1,007 farms in 1982. The average size decreased from 210 acres to 192 acres. In 1969, 22,343 acres was planted in corn and 11,397 in soybeans, and 6,500 acres of corn and 16,800 acres of soybeans were planted in 1985 *(4)*.

Soybeans, peanuts, and corn are the main crops; however, grain sorghum acreage has increased in the last few years. Poultry production, mainly of broilers, is one of the leading farm enterprises. Hogs and beef cattle are the main livestock, but dairy cows are raised on some farms.

Physiography, Relief, and Drainage

Covington County is entirely in the Lower Coastal Plain Physiographic Province. The ridgetops are broad and gently sloping, with sloping to steep side slopes along the drainageways. Some fairly broad, nearly level terraces are along the Conecuh and Yellow Rivers and some of the larger creeks in the county. These terraces can flood during abnormal rainfall.

The major drainage systems are the Conecuh and Yellow Rivers and the Pigeon, Patsaliga, Five Runs, Poley, Lightwood Knot, Pond, Blackwater, Corner, and Panther Creeks. Surface drainage is generally adequate; however, some large sinkholes and short drainageways do not have surface drainage outlets.

Many sinkholes are in the county, especially in the southern part. They vary from 0.25 acre to several acres. Some of the sinkholes hold water and others are dry. Open Pond in the Conecuh National Forest and Lake Jackson at Florala are sinkholes that hold water. The water level fluctuates widely from year to year in most of the sinkholes.

Elevation ranges from 100 feet above mean sea level in the southern part of the county to about 450 feet in the northeastern part.

Geology

Geologic units that crop out in Covington County range in age from Eocene to Recent. They are of sedimentary origin and consist of limestone, sandstone, siltstone, claystone, clay, sand, and gravel. The beds strike southeast and dip southwest at 20 to 35 feet per mile *(11)*.

Eocene units that crop out in the county include, from oldest to youngest, the Tuscahoma Sand, Hatchetigbee, and Tallahatta Formations undifferentiated, Lisbon Formation, and Jackson Group.

The Oligocene series overlies the Eocene series and consists of beds equivalent to the Marianna Limestone, Byram Formation, and Chickasawhay Limestone.

The Miocene series overlies the Oligocene series and consists of beds equivalent to the Paynes Hammock Sand and the Catahoula Sandstone.

Residuum derived from the solution of limestones in the Eocene and Oligocene series overlies the Lisbon Formation in the northern part of the county and the lower part of the Jackson Group in the south-central part. Alluvial deposits of Pleistocene to Recent age overlie older sediments in and adjacent to the Conecuh River and valleys of major creeks.

Climate

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

Covington County has long, hot summers because moist tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short, and have only a rare cold wave that moderates in 1 or 2 days. Precipitation is fairly heavy throughout the year, and prolonged droughts are rare. Summer precipitation, mainly afternoon thundershowers, is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Andalusia, Alabama, in the period 1951 to 1978. 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 36 degrees. The lowest temperature on record, which occurred at Andalusia on January 19, 1977, is 5 degrees. In summer the average temperature is 79 degrees, and the average daily maximum temperature is 92 degrees. The highest recorded temperature, which occurred at Andalusia on June 29, 1954, is 105 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 58.54 inches. Of this, 31 inches, or 53 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 22 inches. The heaviest 1-day rainfall during the period of record was 12.28 inches at Andalusia on April 10, 1975. Thunderstorms occur on about 75 days each year, and most occur in summer.

Snowfall is rare. In 95 percent of the winters, there is no measurable snowfall. In 5 percent, the snowfall, usually of short duration, is more than 1 inch. The heaviest 1-day snowfall on record was more than 1.5 inches.

The average relative humidity in midafternoon is about 85 percent. Humidity is higher at night, and the average at dawn is about 65 percent. The sun shines 65 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 10 miles per hour, in winter.

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

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; 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 from 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 in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil 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-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 soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, 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. 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 are generally collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

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

The general procedures followed in making this survey are described in the National Soils Handbook of the Soil Conservation Service. The Soil Survey of Covington County, published in 1912, and the generalized Geologic Map of Covington County, Alabama, were used *(11)*.

Before the actual fieldwork began, preliminary boundaries of landforms were plotted stereoscopically on high altitude aerial photographs taken in 1976 at a scale of 1:24,000 and photographs at the same scale and other scales. Soil surveys produced for conservation planning since 1912 were studied to relate land and image features. A vehicular reconnaissance was then made before traversing and transecting the surface.

General soil map units 1, 8, and 9 were surveyed by a random transect method *(7)* and random observations made by truck on the existing network of roads and trails.

Traverses were made on foot and by truck in the rest of the survey area. Most of the traverses were made at intervals of about one-fourth mile. Traverses at closer intervals were made in areas of high variability. Some areas of high variability are in General Soil Map Units 2 and 4.

Soil examinations along the traverses were made 100 and 400 yards apart, depending on the landscape and soil pattern *(8)*. Observations of such items as landforms, blown down trees, vegetation, roadbanks, and animal burrows were made continuously without regard to spacing. Soil boundaries were determined on the basis of landform position, soil examinations, observations, and photo interpretation. The soil material was examined with the aid of a spade, a hand auger, or a truck probe to a depth of about 5 feet or to bedrock if the bedrock was at a depth of less than 5 feet. The pedons described as typical were observed and studied in pits that were dug by hand.

Samples for chemical and physical analyses and engineering test data were taken from the site of the typical pedon of most of the major soils in the survey area. The analyses were made by Auburn University, Auburn, Alabama, and by the State of Alabama Highway Department, Montgomery, Alabama. Some of the results of the analyses are published in this soil survey.

After completion of the soil mapping on high altitude aerial photographs, map unit delineations were transferred by hand to photo base sheets at a scale of 1:20,000. Surface drainage was mapped in the field. Cultural features and section corners were transferred from U.S. Geological Survey 7.5-minute topographic maps and were recorded from visual observations.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. 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 soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. In the detailed soil map units, these latter soils are called inclusions or included soils. In the general soil map units, they are called soils of minor extent.

Most inclusions have properties and behavioral patterns 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 (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed, and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

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

General Soil Map Units

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

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

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

The soils in Covington County vary widely in their potential for major land uses. Table 4 shows the extent of the map units shown on the general soil map. It lists the potential of each, in relation to that of the other map units, for major land uses and shows soil properties that limit use. Soil potential ratings are based on the practices commonly used in the survey area to overcome soil limitations. These ratings reflect the ease of overcoming the limitations. They also reflect the problems that will persist even if such practices are used.

Each map unit is rated for *cultivated crops, woodland, urban uses, recreation areas,* and *wildlife habitat.* Cultivated crops are those grown extensively in the survey area. Woodland refers to areas of native or introduced trees. Urban uses include residential, commercial, and industrial developments. Intensive recreation areas are campsites, picnic areas, ballfields, and other areas that are subject to heavy foot traffic. Extensive recreation areas are those used for nature study and as wilderness. Wildlife habitat refers to those areas available for food and cover for wildlife.

Nearly Level to Gently Sloping Soils that are Excessively Drained, Moderately Well Drained, Somewhat Poorly Drained, Poorly Drained, and Very Poorly Drained; Subject to Flooding

The two map units in this group make up about 13 percent of the survey area. The soils generally are poorly to well suited to use as cropland, to recreational uses, and as wildlife habitat areas; fairly or well suited to use as woodland; and poorly suited to urban uses.

1. Muckalee-Bibb-Dorovan

Loamy and mucky soils that are poorly drained and very poorly drained; formed in alluvial sediments

The landscape is broad to narrow, nearly level flood plains. The areas are long and narrow and generally are cut by old channels and sloughs. Slopes range from 0 to 2 percent. The natural vegetation is mostly hardwoods and a few pines. The areas are frequently flooded, mainly late in winter and early in spring. The high water table is near or above the surface for long periods.

Very little of the acreage of this map unit has been cleared. The areas are extremely difficult to traverse because of the lush understory of briers and vines. Some areas that were cleared have reverted to woodland, mainly bay, sweetgum, blackgum, maple, and yellow poplar.

This map unit makes up about 9 percent of the survey area. It is about 30 percent Muckalee soils, 25 percent Bibb soils, 12 percent Dorovan soils, and 33 percent soils of minor extent.

Muckalee soils are nearly level, deep, and poorly drained. They are at a slightly higher elevation on flood plains. The surface layer is gray sandy loam and is underlain by stratified sandy loam and loamy sand.

Bibb soils are nearly level, deep, and poorly drained. They are on flood plains adjacent to toe slopes and along stream channels. The surface layer is dark gray loam and is underlain by light gray sandy loam and sand.

Dorovan soils are nearly level, deep, and very poorly drained. These organic soils are mostly at a lower elevation. The surface layer is very dark brown mucky peat about 1 inch thick and is underlain by layers of black muck.

Of minor extent are the Osier and Iuka soils on flood plains and the Bethera, Florala, Lynchburg, and Rains soils on low terraces.

The soils of this map unit are not suited to cultivated crops and are very poorly suited to use as pasture because of the high water table and frequent flooding. If the soil is wet, grazing causes compaction and sod damage, which are major concerns in pasture management.

These soils are fairly suited to use as woodland. Bay, sweetgum, blackgum, maple, and yellow poplar, mixed with a few pine are predominant. Productivity is high, but wetness and the high water table restrict logging operations. Harvesting should be done when the water table is below a depth of 18 inches and the soil is dry. Logging can cause deep ruts if the soil is too wet.

The soils of this map unit have severe limitations for urban uses because of wetness, the high water table, and the hazard of flooding. These limitations are difficult to overcome.

These soils are poorly suited to use as intensive and extensive recreation areas because of flooding and wetness.

The soils of this map unit are poorly suited to use as habitat for openland wildlife and fairly suited to woodland wildlife. They are well suited to use as habitat for wetland wildlife.

2. Eunola-Lynchburg-Bigbee

Sandy and loamy soils that are moderately well drained, somewhat poorly drained, and excessively drained; formed in alluvial sediments

The landscape is broad, nearly level stream terraces, mainly along the Conecuh River and the Yellow River. These soils are rarely flooded; however, flooding is possible under abnormal conditions. The terraces are dissected by small creeks and low, wet areas. Slopes range from 0 to 5 percent. The higher areas are well drained, loamy and sandy soils, and the low areas are moderately well drained and somewhat poorly drained, loamy soils. A few potholes of poorly drained soils are included in this map unit.

About 50 percent of the acreage of this map unit has been cleared. The cleared areas are mostly on the higher part of the terraces and are used as cropland or pasture. Most of the low, wetter part is woodland, and the cleared areas are used as pasture. Some areas have been clearcut and replanted to pines (fig. 1). A few farmsteads are on the terraces, generally in the higher, well drained areas.

This map unit makes up about 4 percent of the survey area. It is about 35 percent Eunola soils, 20 percent Lynchburg soils, 15 percent Bigbee soils, and 30 percent soils of minor extent.

Eunola soils are nearly level, deep, and moderately well drained. They are at an intermediate level on the terraces. The surface layer is very dark gray loamy fine sand. The subsoil is yellowish brown sandy clay loam underlain by stratified yellowish brown sandy loam and sandy clay loam.

Lynchburg soils are nearly level, deep, and somewhat poorly drained. They are on the lower part of the terraces. The surface layer is very dark gray sandy loam. The subsurface layer is brown sandy loam. The subsoil is mottled yellow, gray, and brown sandy clay loam.

Bigbee soils are nearly level and gently sloping, deep, and excessively drained. They are on the higher part of the terraces. The surface layer is dark grayish brown loamy sand. The underlying material is yellowish brown sand.

Of minor extent are the Bethera and Rains soils in depressions and at a lower elevation and the Chrysler, Kalmia, and Maxton soils on ridges on the terraces.

The soils of this map unit are well suited to use as cropland and pasture. Wetness is the main limitation in use and management. In many places, the high water table is within 18 inches of the surface. The low areas are difficult to drain because they do not have a suitable outlet, and the higher areas are droughty and are better suited to use as pasture. Using a sod crop part of the time in a crop rotation system helps to maintain tilth and increases organic matter and yields.

The soils of this map unit are well suited to use as woodland. Mixed hardwoods and pines are the natural vegetation. Productivity is high. The high water table in the low areas restricts logging operations, but the higher areas have no significant limitations.

The soils of this map unit are severely limited for urban uses because of the high water table and the hazard of flooding, both of which are difficult to overcome.

These soils are only fairly suited to use as intensive recreation areas because of flooding and wetness. They are well suited to use as extensive recreation areas.

These soils are well suited to use as habitat for openland and woodland wildlife and poorly suited to use as habitat for wetland wildlife.

Dominantly Nearly Level to Moderately Sloping Soils that are Well Drained, Moderately Well Drained, and Somewhat Poorly Drained

The two map units in this group make up about 9 percent of the survey area. The soils generally are fairly suited to use as cropland, well suited to use as woodland, fairly to well suited to recreational use and as wildlife habitat areas, and poorly to fairly suited to urban uses.

3. Florala-Fuquay

Loamy and sandy soils that are somewhat poorly drained and well drained; formed in unconsolidated marine sediments

The landscape is broad, nearly level uplands broken by gently sloping sandy knolls. These level areas form the heads of small streams. In some areas, determining the direction of the drainage is difficult. Slopes range from 0 to 5 percent. The natural vegetation is mixed hardwoods and pines.

About 20 percent of the acreage of this map unit has been cleared. The cleared areas are mostly on the larger sandy knolls. Soybeans and pasture plants are the main

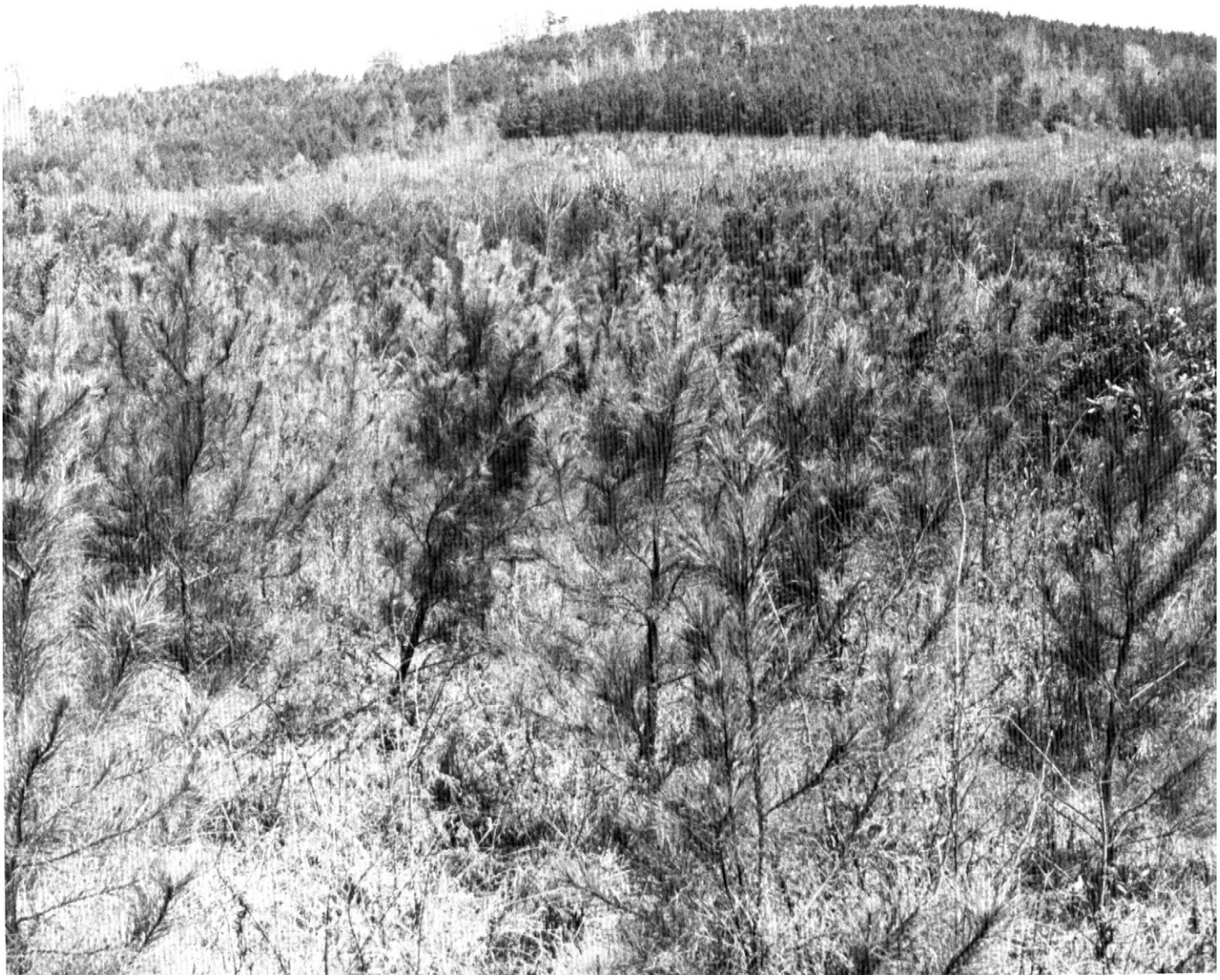


Figure 1.—Young pines grow on Eunola fine sandy loam, 0 to 2 percent slopes, rarely flooded, in an area of the Eunola-Lynchburg-Bigbee general soil map unit. The steep hills in the background are in the Arundel-Troup-Luverne general soil map unit.

crops. The soils in uncleared areas are moderately well drained and nearly level. Water ponds in these areas during wet periods. Many areas in this map unit have been clearcut and replanted to pine. Farm structures and dwellings are in some of the open areas on the knolls.

This map unit makes up about 4 percent of the survey area. It is about 65 percent Florala soils, 20 percent Fuquay soils, and 15 percent soils of minor extent.

Florala soils are nearly level, deep, and somewhat poorly drained. They are on broad flats. The surface layer is dark gray sandy loam. The upper part of the subsoil is yellowish brown sandy loam, and the lower part of the subsoil is mottled yellow, brown, gray, and red sandy clay loam with plinthite.

Fuquay soils are nearly level to gently sloping, deep, and well drained. They are on knolls. The surface and subsurface layers are dark grayish brown and yellowish brown loamy fine sand. The upper part of the subsoil is yellowish brown sandy loam. The lower part is strong brown sandy clay loam that has red, gray, and yellow mottles. The lower part of the subsoil also has plinthite.

Of minor extent are the Grady and Rains soils on the lower part of the landscape, and the Bonifay, Dothan, and Malbis soils on knolls and gently sloping ridges.

The soils of this map unit are fairly suited to crops and well suited to hay and pasture. Because of the seasonal high water table, the moderately well drained soils are late to warm in the spring. Suitable outlets for surface drainage are difficult to locate. The hazard of erosion is moderate on the knolls but is not a problem in the nearly level areas.

The soils of this map unit are well suited to use as woodland. In the low, wet areas, the woodland is predominantly longleaf pine, slash pine, water oak, maple, bay, and sweetgum; and on the knolls, it is longleaf pine, turkey oak, post oak, blackjack oak, dogwood, and hickory. Productivity is high in the wet areas and moderate to low on the knolls. Logging should be done when the soils are dry because these activities cause deep ruts in the logging roads and skid trails if the soils are wet. The soils on the knolls are subject to erosion.

The soils on the knolls have slight and moderate limitations for most urban uses. The soils in the low, wet areas have severe limitations for most urban uses because of wetness and the seasonal high water table.

These soils are only fairly suited to use as intensive recreation areas because of wetness. They are well suited to use as extensive recreation areas.

These soils are well suited to use as habitat for openland and woodland wildlife and fairly suited to habitat for wetland wildlife.

4. Blanton-Lynchburg

Sandy and loamy soils that are moderately well drained and somewhat poorly drained; formed in sandy and loamy marine sediments

The landscape is broad, nearly level to sloping uplands dissected by nearly level, wet areas and small drainageways. The sloping areas are along the drainageways and are adjacent to the nearly level, wet areas. Slopes range from 0 to 12 percent. The natural vegetation is mostly mixed hardwoods and pines.

About 50 percent of the acreage of this map unit has been cleared. The soils in the cleared areas are mostly used as cropland, pasture, or for hay. Soybeans, corn, peanuts, and garden crops are the main cultivated crops. The uncleared acreage is mainly in the nearly level, wet areas; however, some of the well drained, upland areas have not been cleared. Farm buildings and dwellings are mainly on the well drained, upland soils.

This map unit makes up about 5 percent of the survey area. It is about 60 percent Blanton soils, 15 percent Lynchburg soils, and 25 percent soils of minor extent.

Blanton soils are nearly level to moderately sloping, deep, and moderately well drained. They are on uplands. The surface layer is brown loamy fine sand. The subsurface layer is light yellowish brown and pale brown loamy fine sand and fine sand. The subsoil is yellowish brown sandy loam and sandy clay loam that has yellowish red mottles.

Lynchburg soils are deep, nearly level, and somewhat poorly drained. They are on a lower elevation. The surface layer is dark gray sandy loam. The subsurface layer is brown sandy loam. The subsoil is mottled yellow, gray, and brown sandy clay loam.

Of minor extent are the Bibb, Muckalee, and Rains soils along the drainageways and in depressions, and the Dothan, Fuquay, Malbis, Orangeburg, and Troup soils at higher elevations on the landscape.

The soils of this map unit are fairly suited to cultivated crops and are well suited to hay and pasture. The sandy upland soils, however, tend to be droughty, and plant nutrients are readily leached from the root zone. The soils in low, wet areas are late to warm in the spring. Suitable outlets for surface drainage are difficult to locate. The hazard of erosion is moderate to severe on the gently sloping and moderately sloping, sandy soils. It is not a problem on the wet soils in low areas.

The soils of this map unit are well suited to use as woodland. In areas of sandy, upland soils, the woodland is longleaf pine, turkey oak, post oak, blackjack oak, dogwood, and hickory; and in the low, wet areas the woodland is water oak, bay, maple, sweetgum, loblolly pine, and longleaf pine. Productivity on the sandy soils is moderate to low, and productivity on the low, wet soils is high. Logging should be done when the soils are dry. These activities cause ruts in the logging roads and skid trails if the soils are wet, thereby creating an erosion hazard on the gently sloping and moderately sloping upland soils.

The soils on uplands have moderate and severe limitations for most urban uses because of seepage, wetness, and the sandy surface layer. The soils in the low, wet areas have severe limitations for most urban uses because of wetness and a seasonal high water table.

These soils are fairly suited to use as intensive recreation areas; however, wetness is a limitation. They are well suited to use as extensive recreation areas.

These soils are fairly suited to use as habitat for openland and wetland wildlife. They are well suited to use as habitat for woodland wildlife.

Dominantly Nearly Level to Moderately Steep Soils that are Well Drained

The three map units in this group make up about 72 percent of the survey area. The soils generally are well to fairly suited to use as cropland, woodland, and recreational areas. They are well to very poorly suited to use as wildlife habitat areas and well to fairly suited to urban uses.

5. Orangeburg-Troup

Loamy and sandy soils that are well drained; formed in unconsolidated marine sediments

The landscape is a mass of broad, nearly level to moderately sloping ridgetops that have moderately steep side slopes above narrow drainageways. The short, prominent drainageways join and become small creeks that flow in winding courses through narrow flood plains. Slopes range from 0 to 20 percent. The natural vegetation is mixed hardwoods and pines.

About 65 percent of the acreage of this map unit has been cleared. The cleared areas are mostly on nearly level to moderately sloping ridgetops. Cleared areas on the moderately steep side slopes are used as pasture. Corn, soybeans, peanuts, grain sorghum, and sod crops for hay and pasture are the principal crops. The uncleared areas are mainly on the moderately steep hillsides; however, some of the broad ridgetops are also uncleared. Farmsteads and dwellings are mainly on the ridgetops. The roads mostly parallel the ridgetops; however, some roads cross the drainageways.

This map unit makes up about 16 percent of the survey area. It is about 60 percent Orangeburg soils, 30 percent Troup soils, and 10 percent soils of minor extent.

Orangeburg soils are deep, nearly level to moderately steep, and well drained. They are on ridgetops and side slopes. The surface layer is brown sandy loam. The upper part of the subsoil is red sandy loam and sandy clay loam, and the lower part is dark red sandy clay loam.

Troup soils are deep, nearly level to moderately sloping, and well drained. They are on ridgetops and side slopes. The surface layer is very dark grayish brown loamy sand. The subsurface layer is brown, yellowish brown, and yellowish red loamy sand. The subsoil is red sandy loam and sandy clay loam.

Of minor extent are the Arundel and Luverne soils on side slopes; the Cowarts, Lucy, and Red Bay soils on knolls and ridges; and the Bibb and Blanton soils along drainageways and on toe slopes.

The soils on the broad, nearly level to moderately sloping ridgetops are mostly cleared and are well suited to cultivated crops (fig. 2), hay, and pasture. The sandy soils, however, tend to be droughty, and plant nutrients are readily leached from the root zone. Erosion is a slight or moderate hazard if the soils are tilled. Crop rotation, terraces, cover crops, and contour farming are necessary to maintain productivity and control erosion. The soils are subject to deep, caving gullies if runoff water concentrates. The sandy soils generally are at a lower elevation on the ridgetops and also are on some of the side slopes.

The soils of this map unit are well suited to use as woodland, and productivity is moderately high. The woodland is predominantly southern red oak, post oak, hickory, dogwood, loblolly pine, and longleaf pine. In many areas, the woodland is clearcut and replanted to pines. The moderately steep slopes and the sandy soils restrict the use of logging equipment, and erosion is a hazard along logging roads and skid trails.

The nearly level to moderately sloping soils in this map unit are well suited to most urban uses; however, seepage is a limitation in the sandy soils. The moderately steep soils have moderate and severe limitations for most urban uses because of slope.

These soils are well suited to use as intensive and extensive recreation areas.

These soils are well suited to use as habitat for openland and woodland wildlife. They are very poorly suited to use as habitat for wetland wildlife.

6. Orangeburg-Cowarts

Loamy soils that are well drained; formed in unconsolidated marine sediments

The landscape is a series of narrow to broad, nearly level to moderately sloping ridgetops that have moderately steep side slopes above the narrow drainageways. The short drainageways join and form the headwaters of the Yellow River and the Five Runs, Lightwood Knot, and Poley Creeks. Slopes range from 0 to 20 percent. The natural vegetation is mixed hardwoods and pines.

About 75 percent of the acreage of this map unit has been cleared. The cleared areas are mostly on gently sloping and moderately sloping ridgetops. Corn, soybeans, peanuts, grain sorghum, and sod crops for hay and pasture are the principal crops. Cleared areas on the moderately steep slopes are in pasture or have reverted to woodland, mainly pines. The uncleared areas are mainly on the moderately steep slopes above the small creeks; however, some broad ridgetops are uncleared. Farmsteads and dwellings are mainly on the ridgetops. Some soils on broad ridgetops are planted to pines.

This map unit makes up about 20 percent of the survey area. It is about 35 percent Orangeburg soils, 30 percent Cowarts soils, and 35 percent soils of minor extent.

Orangeburg soils are deep, nearly level to moderately steep, and well drained. They are on the ridgetops and side slopes. The surface layer is brown sandy loam. The upper part of the subsoil is red sandy loam and sandy clay loam, and the lower part is dark red sandy clay loam.

Cowarts soils are deep, gently sloping to moderately sloping, and well drained. They are on ridgetops and upper side slopes. The surface layer is dark grayish brown loamy sand. The subsurface layer is dark yellowish brown loamy sand. The subsoil is yellowish brown sandy clay loam that has brown and red mottles in the lower part. The substratum is mottled gray, yellow, brown, and red sandy clay loam and sandy loam.

Of minor extent are the Bibb, Grady, Muckalee, Osier, and Rains soils along the drainageways and on toe

Figure 2.—Peanuts is one of the main crops on Orangeburg sandy loam, in an area of the Orangeburg-Troup general soil map unit.

slopes; and the Dothan, Esto, Florala, Fuquay, Lucy, Malbis, and Troup soils on ridgetops and side slopes.

The soils on the broad, nearly level to moderately sloping ridgetops are well to fairly suited to cultivated crops, hay, and to use as pasture. The slopes are generally short and complex, but some areas have long, smooth slopes and can be farmed on the contour. Erosion is a slight to severe hazard if the soils are tilled. Crop rotation, terraces and waterways, cover crops, and contour farming are necessary to maintain productivity and control erosion. The Orangeburg soils are subject to deep, caving gullies if runoff water concentrates. Ponds provide water for livestock in some areas that do not have flowing water.

The soils of this map unit are well suited to use as woodland, and productivity is moderately high. The native woodland is predominantly southern red oak, post oak, hickory, dogwood, loblolly pine, and longleaf pine. The moderately steep slopes restrict the use of logging

equipment, and erosion is a hazard along logging roads and skid trails.

The nearly level to moderately sloping soils of this map unit are well suited to most urban uses; however, the slow permeability in the lower part of Cowarts soils is a limitation for some uses. The moderately steep soils have moderate and severe limitations for most urban uses because of slope.

The soils of this map unit are well suited to use as intensive and extensive recreation areas and also for use as habitat for openland and woodland wildlife. They are very poorly suited to use as habitat for wetland wildlife.

7. Dothan-Bonifay-Fuquay

Loamy and sandy soils that are well drained and have plinthite in some parts of the subsoil; formed in unconsolidated marine sediments

The landscape is narrow to broad, nearly level and gently sloping, upland ridges that have long, gently sloping and moderately sloping side slopes. The drainage system is well developed in most areas; however, a few areas do not have an outlet. The stream channels are shallow and meander over the flood plain. Many small to large sinkholes are in this map unit. Water stands in some of them all year, while others hold water for only short periods. Open Pond, Blue Pond, and Lake Jackson are some of the larger sinkholes that hold water all year. Slopes range from 0 to 10 percent. The natural vegetation is mixed hardwoods and pines.

About 50 percent of the acreage of this map unit has been cleared. The cleared areas are mostly on the ridges. Soybeans, peanuts, and corn are the major crops. The uncleared areas are mainly low and wet; however, many gently sloping upland ridges are also uncleared. The U.S. Forest Service, large private corporations, and individuals own large tracts of land within this map unit.

This map unit makes up about 36 percent of the survey area. It is about 30 percent Dothan soils, 20 percent Bonifay soils, 10 percent Fuquay soils, and 40 percent soils of minor extent.

Dothan soils are deep, nearly level and gently sloping, and well drained. They are on upland ridges. The surface layer is dark grayish brown sandy loam. The subsurface layer is brown sandy loam. The upper part of the subsoil is yellowish brown sandy clay loam, and the lower part is yellowish brown sandy clay loam that has red, brown, and gray mottles. The lower part of the subsoil also has plinthite.

Bonifay soils are deep, nearly level to moderately sloping, and well drained. They are on ridgetops and side slopes. The surface layer is dark gray loamy fine sand. The subsurface layer is yellowish brown loamy fine sand and fine sand. The subsoil is yellowish brown sandy loam that has white and brown mottles. The subsoil also has plinthite.

Fuquay soils are deep, nearly level to gently sloping, and well drained. They are on ridgetops. The surface and subsurface layers are dark grayish brown and yellowish brown loamy fine sand. The upper part of the subsoil is yellowish brown sandy loam. The lower part is strong brown sandy clay loam that has red, gray, and yellow mottles. The lower part of the subsoil also has plinthite.

Of minor extent are the Bibb, Grady, Muckalee, Osier, and Rains soils along the drainageways and in depressions; and the Cowarts, Esto, Florala, Orangeburg, and Troup soils on the ridges and side slopes.

The soils of this map unit are well suited to cultivated crops, hay, and pasture. The hazard of erosion is slight or moderate if the soils are tilled. The sandy Bonifay and Fuquay soils tend to be droughty, and plant nutrients are readily leached from the root zone. Crop rotation, terraces and waterways, cover crops, and contour farming are necessary to maintain productivity and control erosion.

The soils of this map unit are well suited to use as woodland, and productivity is moderate. The woodland is dominantly longleaf pine (fig. 3) and slash pine; in some areas, however, southern red oak, post oak, hickory, dogwood, and longleaf pine are dominant. In many areas, the woodland has been clearcut and replanted to pines. Erosion is a hazard along logging roads and skid trails that are not on the contour.

The soils of this map unit have slight to severe limitations for most urban uses. The slow permeability in the lower part of the subsoil and a seasonal high water table are limitations for many urban uses.

These soils are well suited to use as intensive and extensive recreation areas and also to use as habitat for openland and woodland wildlife. They are very poorly suited to use as habitat for wetland wildlife.

Dominantly Gently Sloping to Steep Soils that are Well Drained

The two map units in this group make up about 6 percent of the survey area. The soils generally are poorly suited or very poorly suited to crops, urban uses, and wildlife habitat areas; well suited to poorly suited to recreational uses; and well suited to use as woodland.

8. Smithdale-Troup-Fuquay

Loamy and sandy soils that are well drained; formed in unconsolidated marine sediments

The landscape is a mass of steep hills, very narrow ridgetops, and very narrow strips in the drainageways. Most drainageways are short and form small creeks that drain into Pigeon Creek or the Conecuh River. Slopes range from 2 to 35 percent. The natural vegetation is mixed hardwoods and pines.

Figure 3.—The soils of the Dothan-Bonifay-Fuquay general soil map unit are well suited to use as woodland, such as this stand of longleaf pine.

About 20 percent of the acreage of this map unit has been cleared. The cleared areas are mostly on the narrow, gently sloping to moderately sloping ridgetops and upper side slopes. Corn, soybeans, hay, pasture plants, and garden crops grow in the small fields on the ridgetops and side slopes. The uncleared areas are on steep hillsides and in narrow strips in the drainageways. A few areas have been clearcut and replanted to pines. Roads are mostly on the ridges.

This map unit makes up about 3 percent of the survey area. It is about 30 percent Smithdale soils, 25 percent Troup soils, 20 percent Fuquay soils, and 25 percent soils of minor extent.

Smithdale soils are deep and well drained. They are on moderately steep and steep side slopes. The surface layer is brown sandy loam. The subsurface layer is yellowish brown sandy loam. The upper part of the subsoil is yellowish red sandy clay loam, and the lower part is yellowish red and strong brown sandy loam that has yellow and brown mottles.

Troup soils are deep and well drained. They are on gently sloping ridgetops and moderately steep side slopes. The surface layer is very dark grayish brown loamy sand. The subsurface layer is brown, yellowish brown, and yellowish red loamy sand. The subsoil is red sandy loam and sandy clay loam.

Fuquay soils are deep and well drained. They are on gently sloping ridgetops. The surface and subsurface layers are dark grayish brown and yellowish brown loamy fine sand. The upper part of the subsoil is yellowish brown sandy loam. The lower part is strong brown sandy clay loam that has red, gray, and yellow mottles. The lower part of the subsoil also has plinthite.

Of minor extent are the Bibb, Blanton, and Muckalee soils along the drainageways and on toe slopes; and the

Dothan, Esto, Florala, Lucy, Luverne, Orangeburg, and Red Bay soils on ridgetops and side slopes.

About 50 percent of the gently sloping and moderately sloping soils are cleared. They are well suited to use as pasture and not suited or poorly suited to use as cropland. Many of the fields are small and some are isolated. Erosion is a hazard, and droughtiness is the main limitation for the use of these soils as cropland. In steep areas, erosion is a hazard and slope is a limitation for use as pasture. In some areas, ponds are needed to provide water for livestock. Some good pond sites are in these areas.

The soils of this map unit are well suited to use as woodland. Southern red oak, post oak, hackberry, beech, yellow poplar, hickory, loblolly pine, shortleaf pine, and longleaf pine are dominant. Productivity is moderate. The steep slopes and sandy soils restrict the use of logging equipment and cause a severe hazard of erosion along the logging roads and skid trails.

The soils on moderately steep to steep slopes have severe limitations for most urban uses because of slope, and the soils on the ridgetops have slight to severe limitations for most urban uses because of the slow permeability and seepage.

Because of slope, the soils of this map unit are only fairly to poorly suited to use as intensive recreation areas. They are well suited to use as extensive recreation areas.

The soils of this map unit are poorly suited to use as habitat for openland wildlife. They are well suited to use as habitat for woodland wildlife and are very poorly suited to use as habitat for wetland wildlife.

9. Arundel-Troup-Luverne

Sandy and loamy soils that are well drained; formed in acid clayey marine sediments and stratified sandy, loamy, and clayey marine sediments

The landscape is a mass of steep hills, very narrow ridgetops, and very narrow strips in the drainageways. Most drainageways are short and form small creeks that drain into the Conecuh River. The Arundel soils are mostly on lower slopes around the heads of Pigeon, Buck, and Patsaliga Creeks. Slopes range from 8 to 35 percent. The natural vegetation is mixed hardwoods and pines.

Very little of the acreage of this map unit has been cleared. The cleared areas are mostly on the narrow ridgetops or toe slopes and are used as pasture. Some cleared areas on narrow ridgetops are used as sites for houses and gardens. Some areas have been clearcut and replanted to pines.

This map unit makes up about 3 percent of the survey area. It is about 50 percent Arundel soils, 25 percent Troup soils, 15 percent Luverne soils, and 10 percent soils of minor extent.

Arundel soils are moderately deep and well drained. They are on moderately sloping to steep lower side slopes and toe slopes. The surface layer is dark grayish brown loamy fine sand. The upper part of the subsoil is yellowish red clay that has pale olive mottles. The lower part of the subsoil is pale olive clay that has yellow and brown mottles. The substratum is soft, rippable, fossiliferous claystone.

Troup soils are deep and well drained. They are on nearly level to steep upper side slopes and narrow ridgetops. The surface layer is very dark grayish brown loamy sand. The subsurface layer is brown, yellowish brown, and yellowish red loamy sand. The subsoil is red sandy loam and sandy clay loam.

Luverne soils are deep and well drained. They are on steep lower side slopes and toe slopes. The surface and subsurface layers are dark grayish brown and brown sandy loam. The upper part of the subsoil is yellowish red clay, and the lower part is yellowish red sandy clay loam. The substratum is stratified layers of brown sandy loam and soft gray shale.

Of minor extent are the Bibb and Muckalee soils in narrow drainageways, and the Lucy, Orangeburg, and Red Bay soils on narrow ridgetops and upper side slopes.

These moderately sloping to steep soils are not suited or poorly suited to cultivated crops and are poorly suited to use as pasture. Slope is the main limitation, and erosion is a hazard.

The soils of this map unit are well suited to use as woodland. Southern red oak, post oak, hackberry, beech, yellow poplar, hickory, loblolly pine, and shortleaf pine are dominant. Productivity is moderate. The steep slopes restrict the use of logging and planting equipment and cause a severe hazard of erosion along the logging roads and skid trails.

The soils of this map unit have severe limitations for urban uses because of steepness of slopes, slow permeability, shrinking and swelling, and the thick sandy surface layer of the Troup soils.

The soils of this map unit are poorly suited to use as intensive recreation areas because of slope. They are well suited to use as extensive recreation areas.

The soils of this map unit are poorly suited to use as habitat for openland wildlife. They are well suited to use as habitat for woodland wildlife and are very poorly suited to use as habitat for wetland wildlife.

Broad Land Use Considerations

The soils in Covington County vary widely in their suitability for major land uses. Approximately 17 percent of the county is used for cultivated crops, mainly soybeans, peanuts, and corn. This cropland is scattered throughout the county, but map units 1, 3, 8, and 9 have very little cropland. For the soils in these map units, the major limitations for crops are wetness, droughtiness, and steep slopes. In addition, frequent flooding is a hazard. The soils in other map units are well suited to

crops. Wetness caused by a high water table is the main limitation for crops in map unit 2. Eunola and Lynchburg soils are dominant. Droughtiness and wetness are the main limitations in map unit 4. Blanton and Lynchburg soils are dominant. The hazard of erosion is the major problem for cultivated crops in map units 5, 6, and 7. Orangeburg, Dothan, and Cowarts soils are dominant.

About 7 percent of the county is in pasture. The soils in map units 2, 3, 4, 5, 6, and 7 are well suited to grasses and legumes. The major soils on stream terraces are Eunola, Kalmia, Maxton, and Lynchburg soils. Orangeburg, Dothan, Cowarts, Fuquay, Troup, and Bonifay are the major soils on uplands.

About 69 percent of the county is woodland. The soils in map units 3, 4, 5, 6, 7, 8, and 9 are well suited to loblolly pine, slash pine, and longleaf pine. Those in map units 1 and 2 are well suited to fairly suited to hardwoods mixed with loblolly pine. The use of equipment is restricted on the soils in map units 8 and 9 because of steepness of slope; in map units 1, 2, and 3 because of wetness; and on Blanton, Bonifay, Fuquay, and Troup soils in map units 4, 5, and 7 because of the thick sandy surface layer.

About 7 percent of the county is urban or built-up land. Generally, the nearly level to sloping Orangeburg, Cowarts, Dothan, and Fuquay soils are well suited to most urban uses. These soils are mainly in map units 3, 5, 6, and 7. The soils on stream terraces and flood plains, such as those in map units 1 and 2, are not suited to or they are poorly suited to urban development because of the hazard of flooding. Soils in map units 8 and 9 are hilly and are poorly suited because of steepness of slope and the clayey subsoil of the Arundel and Luverne soils. Suitable sites for houses or small commercial buildings are generally available in these areas.

The soils range from poorly suited to well suited to recreation uses, depending on the intensity of expected use and properties of the soil. The soils in map units 5, 6, and 7 are well suited to intensive recreation uses, such as playgrounds and camp areas. The soils in map unit 1 are poorly suited to intensive recreation uses because of flooding and wetness, and in map unit 9, the soils are poorly suited because of steepness of slope. The soils in map units 2, 3, 4, and 8 are only fairly suited to intensive recreation uses because of flooding, wetness, or steepness of slope. Small areas in map units that are poorly suited to recreation uses may be suitable for intensive development. The soils in all the map units except for map unit 1 are well suited to extensive recreation use, such as hiking or horseback riding.

The suitability for use as wildlife habitat is generally high throughout the county. The soils in map units 2, 3, 5, 6, and 7 are well suited to use as habitat for openland wildlife; the soils in map units 2, 3, 4, 5, 6, 7, 8, and 9 are well suited to habitat for woodland wildlife; and the soils in map unit 1 are well suited to habitat for wetland wildlife.

Detailed Soil Map Units

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

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

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

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Orangeburg sandy loam, 1 to 5 percent slopes, is one of several phases in the Orangeburg series.

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

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Cowarts-Dothan complex, 2 to 5 percent slopes, is an example.

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Troup-Luverne association, 15 to 45 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils 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 in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Muckalee, Bibb, and Osier soils, 0 to 2 percent slopes, frequently flooded, is an undifferentiated group in this survey area.

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

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

Table 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.

ArE—Arundel loamy fine sand, 8 to 25 percent slopes. This soil is moderately deep and well drained. It is on moderately sloping to steep lower side slopes on uplands of the Coastal Plain. Rock outcrops are common in this map unit. Slopes are complex and convex. Individual areas of this soil are irregular in shape and range from 10 to 500 acres.

Typically, the surface layer is dark grayish brown loamy fine sand 6 inches thick. The subsoil is yellowish red clay to a depth of 14 inches, mottled yellowish red and pale olive clay to a depth of 21 inches, and pale olive clay with yellowish brown and brown mottles to a depth of 30 inches. The underlying bedrock is white fossiliferous claystone that has streaks of brown. It is easily cut with a spade.

Important soil properties:

Permeability: very slow

Available water capacity: low

Reaction: strongly acid to extremely acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: 20 to 40 inches

Root zone: to a depth of 20 to 40 inches

High water table: none within a depth of 6 feet

Flooding: none

Included with this soil in mapping are small areas of Luverne, Orangeburg, and Troup soils. Also included are small areas of soils that have slopes of more than 25 percent. The included soils make up about 20 percent of the map unit, but areas generally are less than 5 acres. Orangeburg and Troup soils are contrasting soils, and their use and management differ from the Arundel soil. The contrasting soils make up about 15 percent of the map unit. Limestone rock outcrops are also in some areas.

This Arundel soil is used mostly as woodland.

This soil is not suited to cultivated crops and is poorly suited to hay and pasture. Steepness of slope, rock outcrops, and very slow permeability are severe limitations. The hazard of erosion is severe. Slope and rock outcrop are limitations for use of equipment in most areas.

This soil is well suited to the production of loblolly pine. Sweetgum and shortleaf pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The understory plants are mainly greenbrier, little bluestem, lespedeza, huckleberry, and flowering dogwood.

Moderate hazard of erosion, limitation for the use of equipment, and plant competition are concerns in managing timber on this soil. The hazard of erosion and the limitation for the use of equipment are caused by steepness of slope and the clayey subsoil. Management activites should include conservation practices to control erosion. Site preparation methods that minimize soil disturbance are needed. Tracked equipment should be used on steep slopes. Competition by undesirable plants reduces growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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.

This soil has severe limitations for most urban uses because of steepness of slope, very slow permeability, high shrink-swell potential, and depth to bedrock. These limitations are difficult to overcome.

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

BgA—Bigbee loamy sand, 0 to 5 percent slopes, rarely flooded. This soil is deep, excessively drained, and sandy. It is on broad, nearly level to gently sloping stream terraces. These soils are rarely flooded; however, flooding is possible under abnormal conditions. Slopes are smooth and slightly concave. Individual areas of this soil are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is dark grayish brown loamy sand 10 inches thick. The underlying material is light yellowish brown sand to a depth of 30 inches, yellowish brown sand to a depth of 42 inches, yellow sand that has brownish yellow and light gray mottles to a depth of 54 inches, and very pale brown sand that has yellow mottles to a depth of 80 inches.

Important soil properties:

Permeability: rapid

Available water capacity: low to very low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: 3.5 to 6 feet below the surface, from January to March

Flooding: rare

Included with this soil in mapping are a few areas of Chrysler, Eunola, Kalmia, Lynchburg, and Maxton soils, and soils that have a fine sand surface layer. Also included along drainageways are short slopes, which are more than 5 percent. The included soils make up about 20 percent of the map unit, but areas are generally less than 5 acres. Chrysler, Eunola, and Lynchburg soils are contrasting soils and their use and management differ from the Bigbee soil. The contrasting soils make up about 10 percent of the map unit.

This Bigbee soil is used mainly as cropland. In some areas, this soil is left idle, and other areas are in scrub hardwood and pine forest.

This soil is only fairly suited to cultivated crops because of droughtiness. It is fairly well suited to pasture

and hay. The leaching of plant nutrients is a concern, and split applications of commercial fertilizer are needed. The hazard of erosion is slight or moderate if this soil is tilled.

This soil is well suited to the production of loblolly pine and longleaf pine. Post oak and water oak are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 80. The understory plants are grassleaf goldaster, post oak, threeawn, little bluestem, and water oak.

Moderate plant competition and moderate seedling mortality that is caused by droughtiness are concerns in managing timber on this soil. In addition, this soil has moderate limitations for the use of equipment. The seedling mortality can be partly overcome by increasing the tree planting rate. Competition by undesirable plants reduces growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition. The sandy texture of the soil restricts the use of wheeled equipment, especially when the soil is very dry. Harvesting operations should be limited to periods when the soil is moist.

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.

This soil has severe limitations for most urban uses because of its susceptibility to flooding, wetness, or seepage. It has poor filtering capacity when used for septic tank absorption fields. Control of flooding generally is not feasible. Pilings or mounds can elevate buildings above the expected level of flooding. If the density of housing is moderate or high, community sewage systems are needed to prevent contamination of water supplies by seepage.

This Bigbee soil is in capability subclass IIIs. The woodland ordination symbol is 8S.

BnB—Blanton loamy fine sand, 0 to 5 percent slopes. This soil is deep, moderately well drained, and nearly level to gently sloping. It is on broad, smooth ridgetops on uplands of the Coastal Plain. Slopes are smooth and slightly convex. Individual areas of this soil are irregular in shape and range from 10 to 300 acres.

Typically, the surface layer is brown loamy fine sand 6 inches thick. The upper part of the subsurface layer, to a depth of 21 inches, is light yellowish brown loamy fine sand. The middle part, to a depth of 45 inches, is very pale brown fine sand that has light yellowish brown mottles. The lower part, to a depth of 62 inches, is light yellowish brown fine sand that has very pale brown mottles. The subsoil to a depth of 80 inches is yellowish brown sandy clay loam that has yellowish red mottles.

Important soil properties:

Permeability: rapid in the surface and subsurface layers and moderate in the subsoil

Available water capacity: low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: 5 to 6 feet below the surface, from December through March

Flooding: none

Included with this soil in mapping are small areas of Cowarts, Dothan, Fuquay, Orangeburg, and Troup soils. Also included are small areas of soils that have a fine sand surface layer. The included soils make up about 15 percent of the map unit, but areas are generally less than 5 acres. Cowarts, Dothan, and Orangeburg soils are contrasting soils, and their use and management differ from the Blanton soil. The contrasting soils make up about 10 percent of the map unit.

About a third of this Blanton soil has been cleared and is used for cultivated crops, pasture, or hay.

This soil is fairly suited to cultivated crops and is suited to pasture and hay. Droughtiness is a moderate limitation. The leaching of plant nutrients is a concern in management, and split applications of commercial fertilizer are needed. Erosion damage is a slight to moderate hazard if this soil is tilled. Terraces are not recommended on this sandy soil; however, slopes are long and smooth and can be plowed on the contour.

This soil is well suited to the production of loblolly pine and longleaf pine. Slash pine and southern red oak are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 80. The understory plants are mainly greenbrier, little bluestem, huckleberry, blackjack oak, hickory, and flowering dogwood.

Moderate seedling mortality, caused by droughtiness, and plant competition are concerns in managing timber on this soil. In addition, this soil has moderate limitations for the use of equipment. The seedling mortality can be partly overcome by increasing the tree planting rate. Competition by undesirable plants reduces growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition. The sandy texture of the thick surface layer restricts the use of wheeled equipment, especially when the soil is very dry. Harvesting operations should be limited to periods when the soil is moist.

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

This soil has moderate and severe limitations for most urban uses because of seepage, wetness, and the sandy surface layer.

This Blanton soil is in capability subclass IIIs. The woodland ordination symbol is 8S.

BnC—Blanton loamy fine sand, 5 to 12 percent slopes. This soil is deep, moderately well drained, and moderately sloping. It is on narrow, winding side slopes on uplands of the Coastal Plain. Slopes are smooth and convex. Individual areas of this soil are irregular in shape and range from 10 to 250 acres.

Typically, the surface layer is grayish brown loamy fine sand 3 inches thick. The upper part of the subsurface layer, to a depth of 15 inches, is pale brown loamy fine sand. The middle part, to a depth of 30 inches, is light yellowish brown loamy sand. The lower part, to a depth of 54 inches, is very pale brown sand that has pockets of uncoated sand grains. The subsoil, to a depth of 60 inches, is yellowish brown sandy loam that has pale brown and strong brown mottles. To a depth of 72 inches, it is yellowish brown sandy clay loam that has light brownish gray and strong brown mottles.

Important soil properties:

Permeability: rapid in the surface and subsurface layers and moderate in the subsoil

Available water capacity: low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: 5 to 6 feet below the surface, from December through March

Flooding: none

Included with this soil in mapping are small areas of Cowarts, Fuquay, Orangeburg, and Troup soils. Also included are a few areas of soils that have a fine sand surface layer and a few areas of soils that have slopes of more than 12 percent. The included soils make up about 20 percent of the map unit, but areas are generally less than 5 acres. Cowarts and Orangeburg soils are contrasting soils, and their use and management differ from the Blanton soil. The contrasting soils make up about 10 percent of the map unit.

About 25 percent of this Blanton soil has been cleared and is used for cultivated crops, pasture, or hay.

This soil is poorly suited to cultivated crops because of droughtiness and the hazard of erosion. It is fairly well suited to hay and pasture. The leaching of plant nutrients is a concern in management, and split applications of commercial fertilizer are needed. The hazard of erosion is moderate to severe if this soil is tilled. Terraces are not recommended on this sandy soil; however, most slopes are long and smooth and can be plowed on the contour.

This soil is well suited to the production of loblolly pine and longleaf pine. Slash pine and southern red oak are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 80. The understory plants are mainly greenbrier, little bluestem, huckleberry, blackjack oak, hickory, and flowering dogwood.

Moderate seedling mortality, caused by droughtiness, and plant competition are concerns in managing timber on this soil. In addition, this soil has moderate limitations for the use of equipment. The seedling mortality can be partly overcome by increasing the tree planting rate. Competition by undesirable plants reduces growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition. The sandy texture of the thick surface layer restricts the use of wheeled equipment, especially when the soil is very dry. Harvesting operations should be limited to periods when the soil is moist.

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

This soil has moderate and severe limitations for most urban uses because of seepage, wetness, slope, and the sandy surface layer.

This Blanton soil is in capability subclass IVs. The woodland ordination symbol is 8S.

BoB—Bonifay loamy fine sand, 0 to 5 percent slopes. This soil is deep, well drained, and nearly level to gently sloping. It is on broad, smooth ridgetops on uplands of the Coastal Plain. Slopes are smooth and convex. Individual areas of this soil are irregular in shape and range from 10 to 300 acres.

Typically, the surface layer is dark gray loamy fine sand 4 inches thick. The upper part of the subsurface layer, to a depth of 14 inches, is yellowish brown loamy fine sand. The middle part, to a depth of 28 inches, is yellowish brown loamy fine sand that has light gray mottles. The lower part, to a depth of 52 inches, is brownish yellow fine sand that has light gray and pale brown mottles. The subsoil, to a depth of 60 inches, is yellowish brown sandy loam that has white mottles and contains about 20 percent plinthite nodules. To a depth of 72 inches, the subsoil is mottled yellowish brown,

white, and pale brown sandy loam and has about 5 percent plinthite nodules.

Important soil properties:

Permeability: rapid in the surface layer, moderate in the upper part of the subsoil, and moderately slow in the lower part

Available water capacity: low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: 4 to 5 feet below the surface, from January through February

Flooding: none

Included with this soil in mapping are small areas of Cowarts, Dothan, Fuquay, Malbis, and Troup soils. Also included are a few areas of soils that have a fine sand surface layer and a few areas that have slopes of more than 5 percent. The included soils make up about 20 percent of the map unit, but areas are generally less than 5 acres. Cowarts, Dothan, and Malbis soils are contrasting soils, and their use and management differ from the Bonifay soil. The contrasting soils make up about 10 percent of the map unit.

About 25 percent of this Bonifay soil has been cleared and is used for crops or pasture. Unimproved forest consists mainly of scrub vegetation, such as turkey oak, blackjack oak, persimmon, sassafras, dogwood, and numerous vines and shrubs.

This soil is fairly suited to cultivated crops and is suited to hay and pasture. Droughtiness, caused by the thick, sandy surface layer, is a limitation. The leaching of plant nutrients is a concern in management, and split applications of commercial fertilizer are needed. The hazard of erosion is slight to moderate if this soil is tilled. The soil is easily tilled throughout a wide range of moisture content. Terraces are not recommended on this sandy soil; however, the slopes are long and smooth and can be plowed on the contour.

This soil is well suited to the production of loblolly pine and longleaf pine. Slash pine is also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 80. The understory plants are mainly greenbrier, little bluestem, huckleberry, blackjack oak, hickory, and flowering dogwood.

Moderate seedling mortality, caused by droughtiness, and plant competition are concerns in managing timber on this soil. In addition, this soil has moderate limitations for the use of equipment. The seedling mortality can be partly overcome by increasing the tree planting rate. Competition from undesirable plants reduces growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition. The sandy texture of the thick surface layer restricts the use of wheeled equipment, especially when the soil is very dry. Harvesting operations should be limited to periods when the soil is moist.

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

This soil has slight limitations for dwellings and local roads and streets. It has moderate limitations for septic tank absorption fields because of slow percolation and wetness. This soil also has severe limitations for sanitary landfills because of the sandy texture, for sewage lagoons because of seepage, and for shallow excavations because cutbanks cave in.

This Bonifay soil is in capability subclass IIIs. The woodland ordination symbol is 8S.

BoC—Bonifay loamy fine sand, 5 to 10 percent slopes. This soil is deep, well drained, and moderately sloping. It is on short, winding side slopes on uplands of the Coastal Plain. Slopes are smooth and convex. Individual areas of this soil are irregular in shape and range from 5 to 300 acres.

Typically, the surface layer is brown loamy fine sand 8 inches thick. The upper part of the subsurface layer, to a depth of 19 inches, is yellowish brown loamy fine sand that has few uncoated sand grains. The lower part, to a depth of 50 inches, is yellowish brown loamy fine sand that has common uncoated sand grains. The subsoil, to a depth of 54 inches, is light yellowish brown sandy loam and to a depth of 70 inches is light yellowish brown sandy clay loam with strong brown mottles. The subsoil contains about 15 percent nodular plinthite in the lower part.

Important soil properties:

Permeability: rapid in the surface layer, moderate in the upper part of the subsoil, and moderately slow in the lower part

Available water capacity: low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: 4 to 5 feet below the surface, from January through February

Flooding: none

Included with this soil in mapping are small areas of Cowarts, Dothan, Fuquay, Muckalee, and Troup soils. Also included are a few areas of soils that have a fine sand surface layer and a few areas of soils that have slopes of more than 10 percent. The included soils make up about 20 percent of the map unit, but areas are generally less than 5 acres. Cowarts, Dothan, and Muckalee soils are contrasting soils, and their use and management differ from the Bonifay soil. The contrasting soils make up about 10 percent of the map unit.

About 25 percent of this Bonifay soil has been cleared and is used for crops or pasture.

This soil is poorly suited to cultivated crops and only fairly suited to hay and pasture because of droughtiness and the hazard of erosion. The leaching of plant nutrients is a concern in management, and split applications of commercial fertilizer are needed. The hazard of erosion is moderate or severe if this soil is tilled. Terraces are not recommended on this sandy soil; however, some slopes are long and smooth and can be plowed on the contour.

This soil is well suited to the production of loblolly pine and longleaf pine. Slash pine is also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 80. The understory plants are mainly greenbrier, little bluestem, huckleberry, blackjack oak, hickory, and flowering dogwood.

Moderate seedling mortality, caused by droughtiness, and plant competition are concerns in managing timber on this soil. In addition, this soil has moderate limitations for the use of equipment. The seedling mortality can be partly overcome by increasing the tree planting rate. Competition by undesirable plants reduces growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition. The sandy texture of the thick surface layer restricts the use of wheeled equipment, especially when the soil is very dry. Harvesting operations should be limited to periods when the soil is moist.

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

This soil has slight limitations for dwellings and local roads and streets. It has moderate limitations for septic tank absorption fields because of slow percolation and wetness. This soil also has severe limitations for sanitary landfills because of the sandy texture, for sewage lagoons because of seepage, and for shallow excavations because cutbanks cave in. If slopes are more than 8 percent, this soil has moderate limitations for most urban uses.

This Bonifay soil is in capability subclass IVs. The woodland ordination symbol is 8S.

CaA—Chrysler sandy loam, 0 to 2 percent slopes, rarely flooded. This soil is deep and moderately well drained. It is on broad, nearly level stream terraces. These soils are rarely flooded; however, flooding is possible under abnormal conditions. Slopes are smooth and slightly convex. Individual areas of this soil are irregular in shape and range from 4 to 50 acres.

Typically, the surface layer is dark grayish brown sandy loam 10 inches thick. The upper part of the subsoil, to a depth of 20 inches, is strong brown clay that has pale brown and yellowish red mottles. The middle part, to a depth of 32 inches, is mottled brownish yellow and light brownish gray clay that has red mottles. The lower part to a depth of 68 inches is mottled yellowish brown and light gray clay.

Important soil properties:

Permeability: slow

Available water capacity: moderate

Reaction: strongly acid or very strongly acid

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 5 feet

High water table: 1.5 to 3 feet below the surface, from January through March

Flooding: rare

Included in mapping are a few areas of Bigbee, Eunola, Kalmia, Lynchburg, and Maxton soils. Also included are small areas of soils that have a loam surface layer. The included soils make up about 15 percent of the map unit, but areas are generally less than 5 acres. Bigbee, Kalmia, and Maxton soils are contrasting soils, and their use and management differ from the Chrysler soil. The contrasting soils make up about 5 percent of the map unit.

This Chrysler soil is used mostly as pasture. A few areas are in mixed hardwood and pine forest.

This soil is well suited to cultivated crops. The seasonal high water table can delay planting in some years. Erosion is not a hazard if this soil is tilled.

This soil is well suited to grasses and legumes for hay and pasture.

This soil is well suited to the production of loblolly pine and slash pine. Sweetgum and water oak are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 100. The understory plants are mainly gallberry, American holly, palmetto, greenbrier, waxmyrtle, sweetbay, and huckleberry.

Severe plant competition is a concern in managing timber on this soil. In addition, this soil has moderate limitations for the use of equipment. These limitations are caused by wetness, and management activities should be conducted during periods when the soil is dry. Plant competition prevents adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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

This soil has severe limitations for most urban uses because of the slow permeability, wetness, and its susceptibility to flooding. Low strength is a limitation for local roads and streets.

This Chrysler soil is in capability subclass IIw. The woodland ordination symbol is 11W.

CdB—Cowarts-Dothan complex, 2 to 5 percent slopes. This complex consists of areas of Cowarts and Dothan soils on narrow, convex ridgetops on uplands of the Coastal Plain. These soils are deep and well drained. Areas of the Cowarts and Dothan soils are too intricately mixed or too small to be mapped separately. Slopes are short and gently sloping. Individual areas are irregular in shape and range from 5 to 200 acres.

The Cowarts soil makes up 45 to 60 percent of the map unit, and the Dothan soil makes up 25 to 40 percent.

Typically, the Cowarts soil has a loamy sand surface layer 6 inches thick. The upper part is dark grayish brown and is 1 inch thick. The lower part is dark yellowish brown and is 5 inches thick. The upper part of the subsoil, to a depth of 18 inches, is yellowish brown sandy clay loam. The lower part, to a depth of 28 inches, is yellowish brown sandy clay loam that has strong brown and red mottles. The substratum to a depth of 60 inches is mottled light gray, brownish yellow, strong brown, red, and yellowish brown sandy clay loam with pockets of sandy loam and sandy clay.

Typically, the Dothan soil has a brown sandy loam surface layer 7 inches thick. The upper part of the subsoil is yellowish brown sandy loam to a depth of 12 inches. The middle part is yellowish brown sandy clay loam to a depth of 46 inches. Below a depth of 36 inches, the middle part contains 20 percent plinthite nodules. The lower part of the subsoil is mottled strong brown, light gray, and reddish brown sandy clay loam to a depth of 60 inches.

Important properties of Cowarts soil:

Permeability: moderate in the subsoil and slow or moderately slow in the substratum

Available water capacity: low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 20 to 40 inches

High water table: none within a depth of 6 feet

Flooding: none

Important properties of Dothan soil:

Permeability: moderate in the upper part of the subsoil and moderately slow in the lower part

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 40 to 60 inches

High water table: 3 to 5 feet below the surface, from January through April

Flooding: none

Included with these soils in mapping are a few areas of Bonifay, Esto, Fuquay, Lucy, and Orangeburg soils. Also included are small areas of soils that have a loamy fine sand surface layer. The included soils make up about 15 percent of the map unit, but areas are generally less than 5 acres. Bonifay, Esto, Fuquay, and Lucy soils are contrasting soils, and their use and management differ from the Cowarts and Dothan soils. The contrasting soils make up about 10 percent of the map unit.

About 75 percent of these Cowarts and Dothan soils is cleared and is used as cropland.

These soils are well suited to cultivated crops and to grasses and legumes for hay (fig. 4) and pasture. If these soils are tilled, traffic pans can form, and the hazard of erosion is slight to moderate. Slopes are short

and complex, but in many areas the slopes are long and smooth and can be terraced and farmed on the contour.

This map unit is well suited to the production of loblolly pine. Slash pine and longleaf pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90 on both the Cowarts and Dothan soils. The understory plants are mainly little bluestem, gallberry, honeysuckle, yellow jessamine, panicum, huckleberry, and flowering dogwood.

Plant competition is a concern in managing timber on these soils. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

These soils have good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife.

These soils have slight limitations for most urban uses. Moderately slow and slow permeability is a severe limitation for septic tank absorption fields. Seepage is a moderate limitation for sewage lagoons in the Dothan soil. Wetness in the Dothan soil is a moderate limitation for trench sanitary landfills, shallow excavations, and dwellings with basements. These limitations can be overcome or reduced by good design and careful installation.

Cowarts and Dothan soils are in capability subclass IIe. The woodland ordination symbol for both soils is 9A.

CdC—Cowarts-Dothan complex, 5 to 10 percent slopes. This complex consists of areas of Cowarts and Dothan soils on very narrow, sloping ridgetops and side slopes on uplands of the Coastal Plain. These soils are deep and well drained. Areas of the Cowarts and Dothan soils are too intricately mixed on the landscape or too small to be mapped separately. In some areas, soil texture, thickness of the surface layer, and depth of the subsoil are extremely variable and change considerably over short distances. Slopes are short and very complex. Individual areas are irregular in shape and range from 5 to 300 acres.

Figure 4.—Coastal bermudagrass has been harvested for hay in this area of Cowarts-Dothan complex, 2 to 5 percent slopes.

The Cowarts soil makes up 50 to 70 percent of the map unit, and the Dothan soil 20 to 30 percent.

Typically, the Cowarts soil has a brown loamy sand surface layer 5 inches thick. The subsoil, to a depth of 20 inches, is strong brown sandy clay loam. The substratum to a depth of 60 inches is mottled reddish yellow, light brownish gray, light yellowish brown, yellowish red, and yellowish brown sandy clay loam with pockets or layers of sandy loam and sandy clay.

Typically, the Dothan soil has a dark grayish brown sandy loam surface layer 6 inches thick. The upper part of the subsoil, to a depth of 28 inches, is yellowish brown sandy clay loam. The middle part, to a depth of 42 inches, is yellowish brown sandy clay loam that has strong brown and pale brown mottles. The lower part to a depth of 60 inches is mottled yellowish brown, strong brown, red, light gray, and yellowish red sandy clay loam and contains about 5 percent plinthite nodules.

Important properties of Cowarts soil:

Permeability: moderate in the subsoil and slow or moderately slow in the substratum

Available water capacity: low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 20 to 40 inches

High water table: none within a depth of 6 feet

Flooding: none

Important properties of Dothan soil:

Permeability: moderate in the upper part of the subsoil and moderately slow in the lower part

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 40 to 60 inches

High water table: 3 to 5 feet below the surface, from January through April

Flooding: none

Included with these soils in mapping are a few areas of Blanton, Bonifay, Esto, Fuquay, Orangeburg, and Troup soils. Also included are areas of soils that have a loamy fine sand surface layer. The included soils make up about 30 percent of the map unit, but areas are generally less than 5 acres. Blanton, Bonifay, Esto, Fuquay, and Troup soils are contrasting soils and their use and management differ from the Cowarts and Dothan soils. The contrasting soils make up about 15 percent of the map unit.

About 75 percent of these Cowarts and Dothan soils is cleared and is used as cropland.

These soils are fairly suited to cultivated crops, but erosion is a moderate to severe hazard. If the soil is tilled, traffic pans can form. Slopes are short and very complex, but in some areas, the slopes are long and smooth and can be terraced and farmed on the contour.

These soils are well suited to grasses and legumes for hay and pasture.

These soils are well suited to the production of loblolly pine. Slash pine and longleaf pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90 on both the Cowarts and Dothan soils. The understory plants are mainly little bluestem, gallberry, honeysuckle, yellow jessamine, panicum, huckleberry, and flowering dogwood.

Plant competition is a concern in managing timber on these soils. Competition by undesirable plants reduces adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

These soils have good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife.

These soils have slight limitations for most urban uses. Moderately slow or slow permeability is a severe limitation for septic tank absorption fields; however, this limitation can be reduced by extending field lines and by properly installing the system. Slopes of more than 8 percent cause moderate or severe limitations for some urban uses.

Cowarts and Dothan soils are in capability subclass IIIe. The woodland ordination symbol for both soils is 9A.

CuC—Cowarts-Urban land complex, 2 to 8 percent slopes. This complex consists of Cowarts soil and areas of Urban land on gently sloping or moderately sloping ridgetops and winding side slopes on uplands of the Coastal Plain. The areas of Cowarts soil and Urban land are too intricately mixed or too small to map separately. Slopes are short and convex. Individual areas range from 20 to 500 acres.

The Cowarts soil makes up about 50 percent of the map unit, and Urban land makes up about 40 percent.

Typically, Cowarts soil has a surface layer that is dark yellowish brown loamy sand about 6 inches thick. The upper part of the subsoil, to a depth of 14 inches, is yellowish brown sandy clay loam, and the lower part, to a depth of 23 inches, is yellowish brown sandy clay loam that has strong brown and yellowish red mottles. The substratum to a depth of 60 inches is mottled yellowish brown, light yellowish brown, light gray, strong brown, yellowish red, and red sandy clay loam with pockets of sandy loam and sandy clay.

Important properties of Cowarts soil:

Permeability: moderate in the subsoil and slow to moderately slow in the substratum

Available water capacity: low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 20 to 40 inches

High water table: none within a depth of 6 feet

Flooding: none

Urban land is covered by streets, parking lots, buildings, and other structures that obscure or alter the original soil.

Included in mapping are small areas of Bibb, Bonifay, Dothan, Fuquay, and Orangeburg soils. The included soils make up about 10 percent of the map unit, but areas are generally less than 5 acres. Bibb, Bonifay, and Orangeburg soils are contrasting soils, and their use and management differ from the Cowarts soil. The contrasting soils make up about 5 percent of the map unit.

The Cowarts soil is well suited to use as parks, open space, building sites, lawns, and gardens. If the soil is disturbed or left bare, erosion is a hazard, especially on slopes of more than 4 percent.

The Cowarts soil has slight limitations for use as sites for buildings, local roads and streets, and recreational development. Steepness of slope is a moderate limitation for some uses. This soil has a severe limitation for septic tank absorption fields because of the slow or moderately slow permeability in the substratum; however, this limitation can be reduced by shallow placement of the field lines and by increasing the size of the absorption fields. The risk of corrosion of uncoated steel and concrete is moderate.

This complex is not assigned to a capability subclass and does not have a woodland ordination symbol.

DaA—Dorovan muck, 0 to 1 percent slopes. This organic soil is deep, very poorly drained, and nearly level. It is in broad, smooth bay areas and along streams in the southern part of the county. This soil is subject to flooding or ponding. Water stands on the surface for long periods. Slopes are smooth and slightly concave. Individual areas of this soil are irregular in shape and range from 5 to 300 acres.

Typically, the surface layer is about 1 inch thick. It is very dark brown mucky peat consisting of partly decomposed leaves, roots, twigs, and pine straw. The next layer, to a depth of 15 inches, is black muck that has common faint very dark brown mottles. Below that, to a depth of 70 inches, is black muck.

Important soil properties:

Permeability: moderate

Available water capacity: high

Reaction: extremely acid

Organic matter content: high

Natural fertility: moderate

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 5 feet for roots that can tolerate wet conditions

High water table: up to 1 foot above the surface to 0.5 foot below the surface, from January through December

Flooding: occasional

Included in mapping are small areas of Bibb, Grady, Muckalee, Osier, and Rains soils. Small areas of soils that have organic material ranging from 20 to 51 inches thick are near the edge of the bays. The included soils make up about 10 percent of the map unit, but areas are generally less than 5 acres. The Bibb, Grady, Muckalee, Osier, and Rains soils are contrasting soils, and their use and management differ from the Dorovan soil. These contrasting soils make up about 5 percent of the map unit.

This Dorovan soil is used mostly as woodland.

This soil is not suited to cultivated crops, pasture, and hay because of the high water table, wetness, and load-bearing strength. Equipment, livestock, and people bog down when traversing this wet soil. White-tailed deer bypass these wet areas.

This soil is fairly suited to the production of baldcypress. Water tupelo, blackgum, and sweetbay are also grown. On the basis of a 50-year site curve, the mean site index for baldcypress is 60. The understory

plants are greenbrier, palmetto, aster, sweetbay, and fetterbush lyonia.

Severe seedling mortality and plant competition are concerns in managing timber on this soil. In addition, this soil has severe limitations for use of equipment. To overcome seedling mortality, trees can be planted on beds or the planting rate can be increased. Plant competition from undesirable plants prevents adequate natural or artificial reforestation without intensive site preparation and maintenance. Site preparation controls initial plant competition, and herbicides can control subsequent growth. The seasonal high water table and load-bearing strength of this organic soil restrict the use of equipment to periods when the soil is dry. Using standard-wheeled and tracked equipment when the soil is moist causes rutting and compaction.

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

This soil has severe limitations for most urban uses because of wetness, the high water table, low strength, and the hazard of flooding. Subsidence is a problem if the soil is drained. These limitations are very difficult to overcome.

This Dorovan soil is in capability subclass VIIw. The woodland ordination symbol is 6W.

DmA—Dothan and Malbis sandy loams, 0 to 1 percent slopes. These Dothan and Malbis soils are deep and well drained. They are on broad, nearly level ridgetops on uplands of the Coastal Plain. Each soil is in areas large enough to be mapped separately; however, because of their present and expected use and their similarity, they were not mapped separately. A delineated area can have both soils or can be entirely one soil. Slopes are smooth and convex. Individual areas are irregular in shape and range from 5 to 200 acres.

Typically, the Dothan soil has a surface layer that is brown sandy loam 10 inches thick. The upper part of the subsoil, to a depth of 18 inches, is yellowish brown sandy loam. The middle part, to a depth of 48 inches, is yellowish brown sandy clay loam. The lower part to a depth of 60 inches is yellowish brown sandy clay loam that has yellowish red, strong brown, and light brownish gray mottles. The lower part of the subsoil contains 5 to 6 percent plinthite nodules, by volume, and a few small iron concretions.

Typically, the Malbis soil has a surface layer that is brown sandy loam 10 inches thick. The upper part of the subsoil, to a depth of 24 inches, is yellowish brown loam. The middle part, to a depth of 48 inches, is yellowish brown sandy clay loam. The lower part to a depth of 72 inches is mottled yellowish brown, red, light brownish gray, and strong brown sandy clay loam. The lower part contains about 12 percent plinthite.

Important properties of Dothan soil:

Permeability: moderate in the upper part of the subsoil and moderately slow in the lower part

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 40 to 60 inches

High water table: 3 to 5 feet below the surface, from January through April

Flooding: none

Important properties of Malbis soil:

Permeability: moderate in the upper part of the subsoil and moderately slow in the lower part

Available water capacity: moderate to high

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 40 to 60 inches

High water table: 2.5 to 4 feet below the surface, from December through March

Flooding: none

Included with these soils in mapping are small areas of Blanton, Bonifay, Cowarts, Fuquay, and Orangeburg soils. Also included are soils that have a loamy fine sand surface layer. The included soils make up about 15 percent of the map unit, but areas are generally less than 5 acres. Blanton, Bonifay, and Fuquay soils are contrasting soils, and their use and management differ from the Dothan and Malbis soils. The contrasting soils make up about 5 percent of the map unit.

Many areas of these Dothan and Malbis soils have been cleared and are used mainly as cropland. In the southern part of the county, large areas of these soils are used as woodland.

These soils are well suited to cultivated crops and to grasses and legumes for pasture and hay. Erosion is not a hazard if this soil is used for cultivated crops; however,

crop rotation and crop residue management are important conservation practices.

These soils are well suited to the production of loblolly pine. Slash pine and longleaf pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90 on both the Dothan and Malbis soils. The understory plants are mainly little bluestem, gallberry, honeysuckle, yellow jessamine, greenbrier, sumac, huckleberry, and flowering dogwood.

Moderate plant competition is a concern in managing timber on these soils. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

These soils have good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife.

These soils have moderate and severe limitations for most urban uses. Moderately slow permeability is a severe limitation for septic tank absorption fields. Wetness is a moderate limitation for sanitary landfills and dwellings with basements. Seepage is a moderate limitation for sewage lagoon areas. These limitations can be overcome or reduced by good design and careful installation.

Dothan and Malbis soils are in capability class I. The woodland ordination symbol for both soils is 9A.

DmB—Dothan and Malbis sandy loams, 1 to 5 percent slopes. These Dothan and Malbis soils are deep and well drained. They are on broad, convex ridgetops on uplands of the Coastal Plain. Each soil is in areas large enough to be mapped separately; however, because of their present and expected use and their similarity, these soils were not mapped separately. A delineated area can have both soils or it can be entirely one soil. Slopes are smooth and convex. Individual areas of this soil are irregular in shape and range from 5 to 500 acres.

Typically, the Dothan soil has a surface layer that is dark grayish brown sandy loam 4 inches thick. The subsurface layer is brown sandy loam to a depth of 12 inches. The upper part of the subsoil, to a depth of 44 inches, is yellowish brown sandy clay loam. The middle part, to a depth of 63 inches, is yellowish brown sandy clay loam that has yellowish red and dark brown mottles. The lower part to a depth of 75 inches is light yellowish brown sandy clay loam that has light brownish gray, yellowish red, and strong brown mottles. The subsoil contains 6 to 10 percent nodular plinthite below a depth of 44 inches.

Typically, the Malbis soil has a surface layer that is dark grayish brown sandy loam 9 inches thick. The upper part of the subsoil, to a depth of 22 inches, is yellowish brown loam. The middle part, to a depth of 46 inches, is yellowish brown sandy clay loam. The lower part to a depth of 72 inches is mottled yellowish brown, strong brown, light gray, and yellowish red sandy clay loam. The lower part has 5 percent plinthite nodules.

Important properties of Dothan soil:

Permeability: moderate in the upper part of the subsoil and moderately slow in the lower part

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 40 to 60 inches

High water table: 3 to 5 feet below the surface, from January through April

Flooding: none

Important properties of Malbis soil:

Permeability: moderate in the upper part of the subsoil and moderately slow in the lower part

Available water capacity: moderate to high

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 40 to 60 inches

High water table: 2.5 to 4 feet below the surface, from December through March

Flooding: none

Included with these soils in mapping are small areas of Blanton, Bonifay, Cowarts, Fuquay, and Orangeburg soils. Also included are soils that have a loamy fine sand surface layer. The included soils make up about 20 percent of the map unit, but areas are generally less than 5 acres. Blanton, Bonifay, and Fuquay soils are contrasting soils, and their use and management differ from the Dothan and Malbis soils. The contrasting soils make up about 10 percent of the map unit.

Many of these Dothan and Malbis soils have been cleared and are used mainly as cropland. In the southern

part of the county, large areas of these soils are used as woodland.

These soils are well suited to cultivated crops and to grasses and legumes for hay and pasture. If they are used for cultivated crops, the hazard of erosion is slight or moderate. Slopes are fairly uniform, and in most areas, slopes are long and smooth enough to be terraced and farmed on the contour (fig. 5).

These soils are well suited to the production of loblolly pine. Slash pine and longleaf pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90 on both the Dothan and Malbis soils. The understory plants are mainly little bluestem, gallberry, honeysuckle, yellow jessamine, greenbrier, sumac, huckleberry, and flowering dogwood.

Moderate plant competition is a concern in managing timber on these soils. Competition from undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

These soils have good potential as habitat for openland and woodland wildlife and very poor potential as habitat for wetland wildlife.

These soils have moderate and severe limitations for most urban uses; however, they are well suited to use as sites for dwellings without basements and for small commercial buildings. Moderately slow permeability and wetness are severe limitations for septic tank absorption fields. Wetness is a moderate limitation for sanitary landfills, shallow excavations, and dwellings with basements. Seepage is a moderate limitation for sewage lagoons. These limitations can be overcome or reduced by good design and careful installation.

Dothan and Malbis soils are in capability subclass IIe. The woodland ordination symbol for both soils is 9A.

DuC—Dothan-Urban land complex, 0 to 8 percent slopes. This complex consists of Dothan soil and areas of Urban land on nearly level to moderately sloping ridgetops and side slopes on uplands of the Coastal Plain. The areas of Dothan soil and Urban land are too intricately mixed or too small to map separately. Slopes are smooth and convex. Individual areas range from 10 to 500 acres.

The Dothan soil makes up about 60 percent of the map unit, and Urban land makes up about 30 percent.

Typically, the Dothan soil has a surface layer that is dark grayish brown sandy loam about 8 inches thick. The upper part of the subsoil, to a depth of 48 inches, is yellowish brown sandy clay loam. The middle part, to a

Figure 5.—This area of Dothan and Malbis sandy loams, 1 to 5 percent slopes, is suitable for farming on the contour.

depth of 56 inches, is brownish yellow sandy clay loam that has grayish brown, yellowish brown, and yellowish red mottles. The lower part to a depth of 66 inches is mottled yellowish brown, light brownish gray, and pale brown sandy clay loam. The subsoil has 10 percent, by volume, plinthite nodules below a depth of 48 inches.

Important properties of Dothan soil:

Permeability: moderate in the upper part of the subsoil and moderately slow in the lower part

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 40 to 60 inches

High water table: 3 to 5 feet below the surface, from January through April

Flooding: none

Urban land is covered by streets, parking lots, buildings, and other structures that obscure or alter the soil.

Included in this map unit are small areas of Bibb, Bonifay, Cowarts, Fuquay, Lucy, and Orangeburg soils. The included soils make up about 10 percent of the map unit, but areas are generally less than 5 acres. Bibb, Bonifay, Lucy, Fuquay, and Orangeburg soils are contrasting soils, and their use and management differ from the Dothan soil. The contrasting soils make up about 5 percent of the map unit.

The Dothan soil is well suited to use as parks, open space, building sites, lawns, gardens, trees, and shrubs. Erosion is a hazard, especially on slopes of more than 4 percent, when the soil is disturbed or left bare.

The Dothan soil has slight limitations for use as sites for dwellings without basements, local roads and streets, and recreational development. This soil has moderate limitations for use as sites for dwellings with basements and for sanitary landfills because of wetness and for sewage lagoon areas because of seepage. This soil has severe limitations for use as sites for septic tank absorption fields because of wetness and moderately slow permeability in the lower part of the subsoil; however, these limitations can be reduced by shallow placement of the field lines and by increasing the size of the absorption field. The risk of corrosion of uncoated steel and concrete is moderate.

This complex is not assigned to a capability subclass and does not have a woodland ordination symbol.

EsC—Esto sandy loam, 2 to 8 percent slopes. This soil is deep and well drained. It is on knolls and short, choppy slopes on uplands of the Coastal Plain. Slopes are complex and convex. Individual areas of this soil are irregular in shape and range from 5 to 40 acres.

Typically, the surface layer is dark gray sandy loam 4 inches thick. The upper part of the subsoil, to a depth of 10 inches, is mottled yellowish brown, strong brown, yellowish red, and light gray clay. The middle part, to a depth of 30 inches, is mottled yellowish brown, brown, red, and light gray clay. The lower part to a depth of 60 inches is mottled light gray, brownish yellow, and strong brown clay.

Important soil properties:

Permeability: slow

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: none within a depth of 6 feet

Flooding: none

Included with this soil in mapping are small areas of Cowarts, Dothan, and Fuquay soils. Also included are a few small areas of soils that have a loamy fine sand surface layer and a few small areas of soils that have limestone at a depth of 24 to 40 inches. Soils in some areas have slopes of more than 8 percent. The included soils make up about 15 percent of the map unit, but areas are generally less than 5 acres. Cowarts, Dothan, and Fuquay soils are contrasting soils, and their use and management differ from the Esto soil. The contrasting soils make up about 10 percent of the map unit.

About 25 percent of this Esto soil is cleared and used as cropland.

This soil is fairly suited or poorly suited to cultivated crops. If this soil is used for cultivated crops, the hazard of erosion is moderate to severe. Slopes are short and very complex. The soil in only a few areas has long and smooth slopes that can be terraced and farmed on the contour.

This soil is well suited to hay and pasture.

This soil is well suited to the production of loblolly pine. Slash pine and longleaf pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 80. The understory plants are mainly little

bluestem, greenbrier, sumac, huckleberry, and flowering dogwood.

Moderate plant competition is a concern for managing timber on this soil. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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

This soil has moderate and severe limitations for most urban uses. Slow permeability is a severe limitation for septic tank absorption fields. The clayey texture is a moderate limitation for sanitary landfills and shallow excavations. Shrinking and swelling is a moderate limitation for dwellings and small commercial buildings. Low strength is a severe limitation for local roads and streets. Uncoated steel and concrete are at high risk for corrosion.

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

EuA—Eunola loamy fine sand, 0 to 2 percent slopes, rarely flooded. This soil is deep and moderately well drained. It is on broad, nearly level stream terraces. These soils are rarely flooded; however, flooding is possible under abnormal conditions. Slopes are smooth and slightly convex. Individual areas of this soil are irregular in shape and range from 5 to 150 acres.

Typically, the surface layer is very dark gray loamy fine sand 5 inches thick. The upper part of the subsoil, to a depth of 24 inches, is yellowish brown sandy clay loam. The lower part, to a depth of 44 inches, is mottled yellowish brown, strong brown, and gray sandy clay loam. The substratum is gray stratified sandy loam and sandy clay loam that have yellowish brown mottles and a few thin strata of uncoated sand grains.

Important soil properties:

Permeability: moderate

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 40 to 60 inches for roots that can tolerate wet conditions

High water table: 1.5 to 2.5 feet below the surface, from November through March

Flooding: rare

Included with this soil in mapping are small areas of Bigbee, Chrysler, Kalmia, Lynchburg, and Maxton soils. Also included are soils that have a sandy loam surface layer. The included soils make up about 25 percent of the map unit, but areas are generally less than 5 acres. Bigbee, Kalmia, and Maxton soils are contrasting soils, and their use and management differ from the Eunola soil. The contrasting soils make up about 15 percent of the map unit.

About half the acreage of this Eunola soil is cleared and used for cultivated crops, pasture, or hay. The rest is in mixed hardwood and pine forest.

This soil is well suited to cultivated crops and to grasses and legumes for hay and pasture. Erosion is not a hazard if this soil is tilled. The soil is late to warm in spring and it is boggy during wet periods because of the seasonal high water table.

This soil is well suited to the production of loblolly pine and slash pine. Sweetgum and American sycamore are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The understory plants are mainly gallberry, longleaf uniola, American holly, huckleberry, and sweetgum.

Moderate equipment use limitation and plant competition are concerns in managing timber on this soil. Because wetness limits equipment use, management operations should be scheduled when the soil is dry. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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

This soil has severe to moderate limitations for most urban uses because of wetness and susceptibility to flooding. These limitations are difficult to overcome.

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

FoA—Florala sandy loam, 0 to 3 percent slopes. This soil is deep and somewhat poorly drained. It is on broad, nearly level uplands, stream terraces, and lower side slopes that receive runoff and seepage water. Water stands on the surface for brief periods in winter and spring. Slopes are smooth and slightly convex. Individual areas of this soil are irregular in shape and range from 5 to 300 acres.

Typically, the surface layer is dark gray sandy loam 8 inches thick. The upper part of the subsoil, to a depth of 22 inches, is yellowish brown sandy loam. The middle part, to a depth of 36 inches, is pale brown sandy loam that has light brownish gray and yellowish brown mottles. The lower part to a depth of 72 inches is mottled light gray, yellowish brown, strong brown, and yellowish red sandy clay loam that has 8 percent, by volume, plinthite nodules.

Important soil properties:

Permeability: moderate in the upper part of the subsoil and slow in the lower part

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 5 feet for roots that can tolerate wet conditions

High water table: 1.5 to 2.5 feet below the surface, from December through March

Flooding: none

Included with this soil in mapping are small areas of Bibb, Bonifay, Dothan, Fuquay, and Lynchburg soils. Also included are small areas of soils that have slopes of up to 8 percent. The included soils make up about 20 percent of the map unit, but areas are generally less than 5 acres. Bibb, Bonifay, Dothan, and Fuquay soils are contrasting soils, and their use and management differ from the Florala soil. The contrasting soils make up about 10 percent of the map unit.

About a third of the acreage of this Florala soil is cleared and used for crops or pasture. The rest is in mixed hardwood and pine forest.

This soil is fairly suited to cultivated crops. Because of the seasonal high water table, spring tillage operations can be delayed in most years. Erosion is not a hazard if this soil is tilled.

This soil is well suited to pasture and hay.

This soil is well suited to the production of loblolly pine, slash pine, and longleaf pine. Sweetgum, American sycamore, and water oak are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The understory plants are mainly gallberry, longleaf uniola, American holly, waxmyrtle, huckleberry, sweetgum, and water oak.

Moderate equipment use limitation and plant competition are concerns in managing timber on this soil. Because wetness limits equipment use, management operations should be scheduled when the soil is dry. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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

This soil has severe limitations for most urban uses because of the seasonal high water table and wetness.

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

FuB—Fuquay loamy fine sand, 0 to 5 percent slopes. This soil is deep and well drained. It is on nearly level and gently sloping ridgetops, side slopes, and benches on uplands of the Coastal Plain. Slopes are smooth and convex. Individual areas of this soil are irregular in shape and range from 10 to 300 acres.

Typically, the surface layer is dark grayish brown loamy fine sand 7 inches thick. The subsurface layer, to a depth of 30 inches, is yellowish brown loamy fine sand with common uncoated sand grains. The upper part of the subsoil, to a depth of 37 inches, is yellowish brown sandy loam. The middle part, to a depth of 52 inches, is strong brown sandy clay loam. The lower part to a depth of 66 inches is mottled red, light gray, yellowish brown, strong brown, and pale brown sandy clay loam. The subsoil has 10 percent plinthite below a depth of 37 inches.

Important soil properties:

Permeability: rapid in the surface and subsurface layers, moderate in the upper part of the subsoil, and slow in the lower part

Available water capacity: low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: 4 to 6 feet below the surface, from January through March

Flooding: none

Included with this soil in mapping are small areas of Blanton, Bonifay, Cowarts, Dothan, and Malbis soils. Also included are a few small areas of soils that have a fine sand surface layer and, in some areas, soils that have slopes of more than 5 percent. The included soils make up about 20 percent of the map unit, but areas are generally less than 5 acres. Cowarts, Dothan, and Malbis soils are contrasting soils, and their use and management differ from the Fuquay soil. The contrasting soils make up about 10 percent of the map unit.

About half of this Fuquay soil is used as cropland.

This soil is fairly suited to cultivated crops. Because of the low available water capacity, the soil within 30 inches of the surface tends to be droughty. If the soil is used for cultivated crops, the hazard of erosion is slight to moderate. Slopes are generally uniform. In most areas, this soil has long and smooth slopes and can be terraced (fig. 6) and farmed on the contour.

This soil is well suited to grasses and legumes for hay and pasture.

This soil is well suited to the production of loblolly pine. Slash pine and longleaf pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The understory plants are mainly greenbrier, persimmon, American holly, little bluestem, and flowering dogwood.

Moderate equipment use limitation, seedling mortality, and plant competition are concerns in managing timber on this soil. The sandy surface layer restricts the use of wheeled equipment, especially if the soil is very dry. Harvesting operations should be limited to periods when the soil is moist. Droughtiness causes moderate seedling mortality. Increasing the tree planting rate can partly overcome this limitation. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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.

This soil has slight limitations for most urban uses. Slow permeability in the lower part of the subsoil is a moderate limitation for septic tank absorption fields. The loamy sand surface layer is a moderate limitation for recreation areas. Slope is a moderate limitation for sewage lagoons. This soil has slight limitations for shallow excavations and sanitary landfills.

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

Figure 6.—These terraces that have underground outlets are in an area of Fuquay loamy fine sand, 0 to 5 percent slopes.

GrA—Grady sandy loam, 0 to 2 percent slopes, ponded. This soil is deep and poorly drained. It is in depressional areas, along stream courses, and in old sloughs, mainly in the southeastern part of the county. This soil is covered by 0.5 foot to 3 feet of water for long periods (fig. 7). Many of the ponds in the area are caused by beaver dams. Slopes are smooth and concave. Individual areas are irregular in shape and range from 10 to 100 acres.

Typically, the surface is covered with 2 inches of leaves, roots, and partly decomposed organic material. The surface layer is dark gray sandy loam 18 inches thick. The upper part of the subsoil, to a depth of 34 inches, is light gray sandy clay. The lower part to a depth of 60 inches is light gray clay that has yellowish brown mottles.

Important soil properties:

Permeability: slow

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: moderate

Figure 7.—Water stands for long periods on the surface in this area of Grady sandy loam, 0 to 2 percent slopes, ponded.

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 60 inches for roots that can tolerate wet conditions

High water table: from 3 feet above the surface to 0.5 foot below the surface, from December through June

Flooding: none, subject to ponding

Included with this soil in mapping are small areas of Bibb, Florala, Muckalee, and Rains soils. The included soils make up about 15 percent of the map unit, but areas are generally less than 5 acres. Bibb, Florala, and Muckalee soils are contrasting soils, and their use and management differ from the Grady soil. The contrasting soils make up about 5 percent of the map unit.

This Grady soil is used as woodland consisting of sweetbay, cypress, tupelo gum, and blackgum.

This soil is poorly suited to cultivated crops, pasture, and hay because of poor drainage and ponding.

This soil is fairly suited to the production of baldcypress. Water tupelo and blackgum are also grown. On the basis of a 50-year site curve, the mean site index for baldcypress is 60. The understory plants are mainly sweetgum, blackgum, water tupelo, cypress, and plumegrass.

Because of a high water table, severe equipment use limitations, seedling mortality, and plant competition are concerns in managing timber on this soil. Management activities should be limited to periods when the soil is dry. To overcome seedling mortality, trees can be planted on beds or the planting rate can be increased. Competition by undesirable plants prevents adequate natural or artificial reforestation without intensive site preparation and maintenance. Site preparation controls initial plant competition, and herbicides can be used to control subsequent growth.

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

This soil has severe limitations for urban uses because of poor drainage, slow permeability, and ponding. These limitations are difficult and expensive to overcome.

This Grady soil is in capability subclass Vw. The woodland ordination symbol is 6W.

IbA—Iuka-Bibb sandy loams, 0 to 2 percent slopes, frequently flooded. The Iuka and Bibb soils are on nearly level flood plains along major streams in the county. These soils are deep and moderately well drained and poorly drained. They formed in stratified loamy and sandy fluvial deposits. The Iuka soil is on low discontinuous ridges and knolls on the flood plain, and the Bibb soil is in the low flat areas. Sloughs and old stream channels dissect most of the areas. The soils are subject to frequent flooding of brief duration, mainly in winter and spring. The areas of the Iuka and Bibb soils are too intricately mixed or too small to map separately. Slopes are smooth and complex. Individual areas are generally long and narrow and range from 200 to 2,000 acres.

The Iuka soil and similar soils make up about 40 percent of the map unit, and the Bibb soil and similar soils make up about 35 percent.

Typically, the Iuka soil has a dark grayish brown sandy loam surface layer 9 inches thick. The underlying material, to a depth of 21 inches, is light olive brown sandy loam that has light brownish gray mottles. Below that, to a depth of 29 inches, it is light yellowish brown sandy loam that has light brownish gray mottles. The next layer, to a depth of 34 inches, is yellowish brown sandy loam that has light gray and light yellowish brown mottles. Below that, to a depth of 50 inches, is gray loamy sand that has light gray mottles. Below the loamy sand layer, to a depth of 54 inches, is very dark gray sandy loam. The next layer to a depth of 60 inches is light gray sand.

Typically, the Bibb soil has a very dark gray sandy loam surface layer 12 inches thick. The upper part of the underlying material, to a depth of 18 inches, is grayish brown sandy loam that has brown mottles. The next layer, to a depth of 30 inches, is light brownish gray sandy loam that has pale brown mottles and thin strata of sandier material. Below the sandy loam, to a depth of 40 inches, is light gray loamy sand that has strong brown and yellowish brown mottles. Below that to a depth of 60 inches is light gray sandy loam that has light yellowish brown and yellowish brown mottles.

Important properties of Iuka soil:

Permeability: moderate

Available water capacity: moderate to high

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: moderate

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 5 feet for roots that can tolerate wet conditions

High water table: 1 foot to 3 feet below the surface, from December through April

Flooding: frequent

Important properties of Bibb soil:

Permeability: moderate

Available water capacity: moderate to high

Reaction: strongly acid or very strongly acid

Organic matter content: moderate

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 5 feet for roots that can tolerate wet conditions

High water table: 0.5 foot to 1.5 feet below the surface, from December through April

Flooding: frequent

Included with these soils in mapping are small areas of Eunola, Kalmia, and Rains soils. Also included are small areas of well drained sandy soils along stream banks, poorly drained sandy soils in the low flat areas, and in some areas, a poorly drained soil that is medium acid to neutral. The included soils make up about 25 percent of the map unit, but areas are generally less than 5 acres. Eunola, Kalmia, and Rains soils are contrasting soils, and their use and management differ from the Iuka and Bibb soils. The contrasting soils make up about 10 percent of the map unit.

These Iuka and Bibb soils are used mostly as woodland.

These soils are not suited to cultivated crops and pasture because of frequent flooding, scouring, wetness, and the high water table. These conditions are very difficult and expensive to overcome and require extensive measures in most cases. If the vegetation were removed, these soils would be subject to very severe scouring during periods of flooding.

These soils are fairly suited to the production of loblolly pine. Sweetgum, water oak, eastern cottonwood, and American sycamore are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 100 on Iuka soil and 90 on Bibb soil. The understory plants are mainly gallberry, greenbrier, panicum, buckwheattree, longleaf uniola, and sweetbay.

Iuka soil has moderate limitations and Bibb soil has severe limitations for the use of equipment in managing timber. Severe seedling mortality and plant competition are concerns in management for both soils. The seasonal high water table and flooding restrict the use of equipment to periods when the soil is dry. Standard-wheeled and tracked equipment cause rutting and compaction when the soils are moist. Low-pressure ground equipment can reduce damage to the soils and help to maintain productivity. Seedling mortality is caused by excessive wetness. To overcome seedling mortality, trees can be planted on beds or the planting rate can be increased. Plant competition from undesirable plants can prevent adequate natural or artificial reforestation without intensive site preparation and maintenance. Site preparation controls initial plant competition, and herbicides can control subsequent growth.

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

These soils have severe limitations for most urban uses because of wetness and flooding, which are very difficult and expensive to overcome.

The Iuka and Bibb soils are in capability subclass Vw. The woodland ordination symbol is 11W for Iuka soil and 9W for Bibb soil.

KaA—Kalmia loamy fine sand, 0 to 2 percent slopes, rarely flooded. This soil is deep and well drained. It is on broad, nearly level stream terraces. This soil is rarely flooded; however, flooding is possible under abnormal conditions. Slopes are smooth and slightly convex. Individual areas of this soil are irregular in shape and range from 5 to 50 acres.

Typically, the surface layer is dark grayish brown loamy fine sand 8 inches thick. The subsurface layer is yellowish brown sandy loam to a depth of 12 inches. The subsoil is yellowish brown sandy clay loam to a depth of 34 inches. The substratum is brownish yellow loamy sand to a depth of 40 inches and very pale brown sand to a depth of 60 inches.

Important soil properties:

Permeability: moderate

Available water capacity: low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 30 to 50 inches

High water table: none within a depth of 6 feet

Flooding: rare

Included with this soil in mapping are small areas of Bigbee, Chrysler, Eunola, Lynchburg, and Maxton soils. Also included are soils that have a sandy loam surface layer. The included soils make up about 20 percent of

the map unit, but areas are generally less than 5 acres. Chrysler, Eunola, and Lynchburg soils are contrasting soils, and their use and management differ from the Kalmia soil. The contrasting soils make up about 10 percent of the map unit.

This Kalmia soil is used mostly as cropland. A few areas are in mixed hardwood and pine forest.

This soil is well suited to cultivated crops and to grasses and legumes for hay and pasture (fig. 8). Erosion is not a hazard if this soil is tilled. Crop rotation and crop residue management are important conservation practices. Slopes are smooth or slightly undulating.

This soil is well suited to the production of loblolly pine and slash pine. Sweetgum, yellow poplar, and water oak are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The understory plants are mainly greenbrier, little bluestem, panicum, American holly, lespedeza, longleaf uniola, and flowering dogwood.

Moderate plant competition is a concern in managing timber on this soil. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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

This soil has severe limitations for most urban uses because of its susceptibility to flooding and seepage.

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

LuB—Lucy loamy sand, 0 to 5 percent slopes. This soil is deep and well drained. It is on nearly level or gently sloping ridgetops, side slopes, and benches on uplands of the Coastal Plain. Slopes are smooth and

Figure 8.—Kalmia loamy fine sand, 0 to 2 percent slopes, rarely flooded, is well suited to cultivated crops, such as peanuts.

convex. Individual areas are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is dark brown loamy sand 10 inches thick. The subsurface layer is yellowish red loamy sand to a depth of 29 inches. The upper part of the subsoil is red sandy loam to a depth of 35 inches, and the lower part is red sandy clay loam to a depth of 60 inches.

Important soil properties:

Permeability: rapid in the surface and subsurface layers and moderate in the subsoil

Available water capacity: low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: none within a depth of 6 feet

Flooding: none

Included with this soil in mapping are small areas of Cowarts, Fuquay, Orangeburg, and Troup soils. The included soils make up about 15 percent of the map unit, but areas are generally less than 5 acres. Cowarts and Orangeburg soils are contrasting soils, and their use and management differ from the Lucy soil. The contrasting soils make up about 10 percent of the map unit.

About half of this Lucy soil is used as cropland.

This soil is well suited to cultivated crops (fig. 9) and to grasses and legumes for hay and pasture. Because of the low available water capacity, the soil within 30 inches of the surface tends to be droughty. If the soil is used for cultivated crops, the hazard of erosion is slight to moderate. This soil is easy to work and can be tilled throughout a wide range of moisture content. The soil in most areas has long and smooth slopes and can be terraced and farmed on the contour.

This soil is well suited to the production of loblolly pine. Slash pine and longleaf pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The understory plants are mainly greenbrier, persimmon, American holly, little bluestem, and flowering dogwood.

Moderate plant competition and seedling mortality that is caused by droughtiness are concerns in managing timber on this soil. In addition, this soil has moderate limitations for the use of equipment. The seedling mortality can be partly overcome by increasing the tree planting rate. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition. The sandy texture of the surface layer restricts the use of wheeled equipment, especially when the soil is very dry. Harvesting operations should be limited to periods when the soil is moist.

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.

This soil has slight limitations for most urban uses. Seepage is a severe limitation for sewage lagoons. This soil also has moderate and severe limitations for recreation development because of the sandy surface layer. It is well suited to most other urban uses.

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

LyA—Lynchburg sandy loam, 0 to 2 percent slopes. This soil is deep and somewhat poorly drained. It is on broad, smooth to undulating stream terraces and upland flats. Water stands on the surface for brief periods in winter and spring. Slopes are nearly level or gently sloping. Individual areas of this soil are irregular in shape and range from 5 to 200 acres.

Typically, the surface layer is very dark gray sandy loam 5 inches thick. The subsurface layer is brown sandy loam to a depth of 8 inches. The next layer, to a depth of 16 inches, is yellowish brown sandy loam that has light brownish gray mottles. The upper part of the subsoil, to a depth of 34 inches, is light brownish gray sandy clay loam that has yellowish brown, strong brown, and yellowish red mottles. The lower part to a depth of 65 inches is mottled light brownish gray and strong brown sandy clay loam.

Important soil properties:

Permeability: moderate

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet for roots that can tolerate wet conditions

High water table: 0.5 foot to 1.5 feet below the surface, from November through April

Flooding: none

Figure 9.—Lucy loamy sand, 0 to 5 percent slopes, is well suited to grain sorghum.

Included with this soil in mapping are small areas of Chrysler, Eunola, Florala, Maxton, and Rains soils. Also included are soils that have a loamy sand surface layer and soils that are similar to Lynchburg soil except they are in lower areas and are subject to flooding. The included soils make up about 15 percent of the map unit, but areas are generally less than 5 acres. Chrysler, Maxton, and Rains soils are contrasting soils, and their use and management differ from the Lynchburg soil. The contrasting soils make up about 5 percent of the map unit.

About a third of the acreage of this Lynchburg soil is cleared and used for crops or pasture. The rest is in mixed hardwood and pine forest.

This soil is well suited to cultivated crops, pasture, and hay. Because of wetness and the seasonal high water table, spring tillage operations can be delayed in most years. Erosion is not a hazard if this soil is tilled. Crop rotation and crop residue management are important conservation practices.

This soil is well suited to the production of loblolly pine and slash pine. Longleaf pine, sweetgum, and water oak are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The understory

plants are mainly gallberry, longleaf uniola, American holly, huckleberry, and sweetgum.

Severe plant competition and moderate limitations for the use of equipment are concerns in managing timber on this soil. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition. The equipment use limitation is caused by wetness, and management operations should be limited to periods when the soil is dry.

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

This soil has severe limitations for most urban uses because of the seasonal high water table and wetness. These limitations are difficult and expensive to overcome.

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

MaA—Maxton sandy loam, 0 to 2 percent slopes, rarely flooded. This soil is deep and well drained. It is on broad, nearly level stream terraces. These soils are rarely flooded; however, flooding is possible under abnormal conditions. Slopes are smooth and slightly convex. Individual areas of this soil are irregular in shape and range from 5 to 50 acres.

Typically, the surface layer is dark grayish brown sandy loam 5 inches thick. The subsurface layer is brown sandy loam to a depth of 15 inches. The upper part of the subsoil, to a depth of 25 inches, is yellowish red sandy clay loam. The lower part of the subsoil is yellowish red sandy loam to a depth of 34 inches. The substratum is strong brown loamy sand to a depth of 42 inches and yellow sand to a depth of 60 inches.

Important soil properties:

Permeability: moderate

Available water capacity: moderate to low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 30 to 50 inches

High water table: none within a depth of 6 feet

Flooding: rare

Included with this soil in mapping are small areas of Bigbee, Chrysler, Eunola, Kalmia, and Lynchburg soils. Also included are soils that have a loamy fine sand surface layer. The included soils make up about 20 percent of the map unit, but areas are generally less than 5 acres. Bigbee, Chrysler, Eunola, and Lynchburg soils are contrasting soils, and their use and management differ from the Maxton soil. The contrasting soils make up about 10 percent of the map unit.

This Maxton soil is used mostly as cropland. A few areas are in mixed hardwood and pine forest.

This soil is well suited to cultivated crops and to grasses and legumes for hay and pasture. Erosion is not a hazard if this soil is tilled. Crop rotation and crop residue management are important conservation practices.

This soil is well suited to the production of loblolly pine and slash pine. Sweetgum and water oak are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The understory plants are mainly greenbrier, little bluestem, panicum, American holly, lespedeza, longleaf uniola, and flowering dogwood.

Moderate plant competition is a concern in managing timber on this soil. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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

This soil has severe limitations for most urban uses because of its susceptibility to flooding and seepage.

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

MBA—Muckalee, Bibb, and Osier soils, 0 to 2 percent slopes, frequently flooded. These Muckalee, Bibb, and Osier soils are deep and poorly drained. They are on nearly level or gently undulating flood plains. They are subject to frequent flooding of brief duration, mainly late in winter and in spring. Slopes are smooth and slightly concave except where they are cut with old stream channels. Each soil is in areas large enough to be mapped separately, but were not because of the present and expected use of these soils. Most mapped areas have each soil, but the areas in the southwest and south-central parts of the county do not have Muckalee soil. Bibb and Osier soils are the major soils in the map unit. Individual areas are generally long and narrow and range from 5 to 1,000 acres.

The Muckalee soil makes up about 40 percent of the map unit, the Bibb soil about 30 percent, and the Osier soil about 15 percent.

Typically, the Muckalee soil has a gray sandy loam surface layer 10 inches thick that has pale brown mottles. The texture is variable, ranging from loamy sand to sandy loam or loam. The underlying material is gray sandy loam that has thin strata of sandier material and dark yellowish brown mottles to a depth of 18 inches.

The next layer is gray sandy loam that has dark brown mottles to a depth of 42 inches. Below that, to a depth of 54 inches, is gray sandy loam that has yellowish brown mottles. Below the gray sandy loam to a depth of 60 inches is mottled gray, yellowish brown, and pale brown sandy loam.

Typically, the Bibb soil has a dark gray loam surface layer 3 inches thick. The next layer, 1 inch thick, is undecomposed hardwood leaves, twigs, and fine roots. Below that, to a depth of 11 inches, is a layer of gray loam. The upper part of the underlying material, to a depth of 20 inches, is light gray sandy loam that has strong brown mottles. The middle part, to a depth of 38 inches, is light gray sandy loam. The lower part to a depth of 65 inches is light gray sand.

Typically, the Osier soil has a surface layer that is stratified very pale brown sand and brownish yellow sandy loam 14 inches thick. The subsurface layer, to a depth of 19 inches, is black sandy loam. The upper part of the underlying material, to a depth of 30 inches, is light gray sand that has grayish brown mottles. Below the light gray sand is very dark grayish brown sand that has thin strata of grayish brown sandy material to a depth of 54 inches. Below that to a depth of 60 inches is light gray sand.

Important properties of Muckalee soil:

Permeability: moderate

Available water capacity: low to moderate

Reaction: strongly acid or very strongly acid in the surface layer and medium acid to neutral in the subsurface layer and underlying material

Organic matter content: moderate

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 40 to 60 inches for roots that can tolerate wet conditions

High water table: 0.5 foot to 1.5 feet below the surface, from December through March

Flooding: frequent

Important properties of Bibb soil:

Permeability: moderate

Available water capacity: moderate to high

Reaction: strongly acid or very strongly acid

Organic matter content: moderate

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 40 to 60 inches for roots that can tolerate wet conditions

High water table: 0.5 foot to 1.5 feet below the surface, from December through April

Flooding: frequent

Important properties of Osier soil:

Permeability: rapid

Available water capacity: moderate to low

Reaction: very strongly acid or extremely acid

Organic matter content: moderate

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 40 to 60 inches for roots that can tolerate wet conditions

High water table: 0 to 1 foot below the surface, from November through March

Flooding: frequent

Included with these soils in mapping are small areas of Bethera, Dorovan, Florala, Iuka, and Rains soils. Also included along the stream banks are soils that have stratified sandy deposits. The included soils make up about 15 percent of the map unit, but areas are generally less than 5 acres. Bethera, Florala, and Rains soils are contrasting soils, and their use and management differ from the Muckalee, Bibb, and Osier soils. The contrasting soils make up about 10 percent of the map unit.

These Muckalee, Bibb, and Osier soils are used mostly as woodland (fig. 10).

These soils are not suited to cultivated crops and are poorly suited to pasture and hay because of frequent flooding, the high water table, and wetness.

These soils are fairly suited to the production of loblolly pine and slash pine. Water oak and sweetgum are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90 on Muckalee and Bibb soils and 80 on Osier soil. The understory plants are mainly panicum, gallberry, buckwheattree, longleaf uniola, sweetbay, and greenbrier.

Severe seedling mortality, caused by excessive wetness, and plant competition are concerns in managing timber. In addition, these soils have severe limitations for the use of equipment. To overcome seedling mortality, trees can be planted on beds or the

Figure 10.—Muckalee, Bibb, and Osier soils, 0 to 2 percent slopes, frequently flooded, are fairly suited to use as woodland.

planting rate can be increased. Competition by undesirable plants prevents adequate natural or artificial reforestation without intensive site preparation and maintenance. Site preparation controls initial plant competition, and herbicides can control subsequent growth. The seasonal high water table and flooding restrict the use of equipment to periods when the soil is dry. Using standard-wheeled and tracked equipment when the soil is moist causes rutting and compaction. Using low-pressure ground equipment reduces damage to the soils and helps to maintain productivity.

These soils have poor potential as habitat for openland wildlife and fair potential as habitat for woodland and wetland wildlife.

These soils have severe limitations for most urban uses because of wetness and flooding. These limitations are difficult and expensive to overcome.

Muckalee, Bibb, and Osier soils are in capability subclass Vw. The woodland ordination symbol is 9W for Muckalee and Bibb soils and 8W for Osier soil.

OrA—Orangeburg sandy loam, 0 to 1 percent slopes. This soil is deep and well drained. It is on nearly level ridgetops on uplands of the Coastal Plain. Slopes

are smooth and slightly convex. Individual areas of this soil are irregular in shape and range from 10 to 100 acres.

Typically, the surface layer is dark grayish brown sandy loam 8 inches thick. The subsurface layer is dark yellowish brown sandy loam to a depth of 18 inches. The upper part of the subsoil is yellowish red fine sandy loam to a depth of 24 inches. The middle part is red sandy clay loam to a depth of 48 inches, and the lower part is yellowish red sandy clay loam to a depth of 72 inches.

Important soil properties:

Permeability: moderate

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: none within a depth of 6 feet

Flooding: none

Included with this soil in mapping are small areas of Dothan, Lucy, Malbis, Red Bay, and Troup soils. Also included are soils that have a loamy sand surface layer. The included soils make up about 15 percent of the map unit, but areas are generally less than 5 acres. Lucy and Troup soils are contrasting soils, and their use and management differ from the Orangeburg soil. The contrasting soils make up about 5 percent of the map unit.

This Orangeburg soil is used mostly as cropland.

This soil is well suited to cultivated crops and to grasses and legumes for hay and pasture. Erosion is not a hazard if this soil is tilled. Crop rotation and crop residue management are important conservation practices.

This soil is well suited to the production of loblolly pine. Longleaf pine and slash pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The understory plants are mainly little bluestem, honeysuckle, yellow jessamine, greenbrier, sumac, huckleberry, and flowering dogwood.

Moderate plant competition is a concern in managing timber on this soil. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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

This soil has slight limitations for most urban uses; however, seepage is a moderate limitation for sewage lagoons. Special treatment to seal the bottom of the lagoon can reduce this limitation.

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

OrB—Orangeburg sandy loam, 1 to 5 percent slopes. This soil is deep and well drained. It is on nearly level and gently sloping ridgetops on uplands of the Coastal Plain. Slopes are complex and convex. Individual areas of this soil are irregular in shape and range from 10 to 200 acres.

Typically, the surface layer is brown sandy loam 8 inches thick. The upper part of the subsoil, to a depth of 14 inches, is red sandy loam. The middle part, to a depth of 48 inches, is red sandy clay loam. The lower part to a depth of 60 inches is dark red sandy clay loam.

Important soil properties:

Permeability: moderate

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: none within a depth of 6 feet

Flooding: none

Included with this soil in mapping are small areas of Cowarts, Dothan, Lucy, Malbis, Red Bay, and Troup soils. The included soils make up about 20 percent of the map unit, but areas are generally less than 5 acres. Cowarts, Lucy, and Troup soils are contrasting soils, and their use and management differ from the Orangeburg soil. The contrasting soils make up about 10 percent of the map unit.

This Orangeburg soil is used mostly as cropland.

This soil is well suited to cultivated crops and to grasses and legumes for hay and pasture (fig. 11). If this soil is used for cultivated crops, the hazard of erosion is slight to moderate. Slopes are generally complex, but the soil in most areas has long and smooth slopes and can be terraced and farmed on the contour. A concentration

of water that does not have a proper outlet creates deep, caving gullies in this soil.

This soil is well suited to the production of loblolly pine. Longleaf pine and slash pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The understory plants are mainly little bluestem, honeysuckle, yellow jessamine, greenbrier, sumac, huckleberry, and flowering dogwood.

Moderate plant competition is a concern in managing timber on this soil. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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

This soil has slight limitations for most urban uses; however, seepage is a moderate limitation for sewage lagoons. Special treatment to seal the bottom of the lagoon can reduce this limitation.

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

OrC—Orangeburg sandy loam, 5 to 8 percent slopes. This soil is deep and well drained. It is on sloping ridgetops and side slopes on uplands of the Coastal Plain. Slopes are complex and convex. Individual areas of this soil are irregular in shape and range from 5 to 300 acres.

Typically, the surface layer is brown sandy loam 6 inches thick. The upper part of the subsoil, to a depth of

Figure 11.—This bahiagrass pasture is in an area of Orangeburg sandy loam, 1 to 5 percent slopes.

40 inches, is red sandy clay loam. The lower part is dark red sandy clay loam to a depth of 60 inches.

Important soil properties:

Permeability: moderate

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: none within a depth of 6 feet

Flooding: none

Included with this soil in mapping are small areas of Cowarts, Dothan, Lucy, Malbis, Red Bay, and Troup soils. The included soils make up about 20 percent of the map unit, but areas are generally less than 5 acres. Cowarts, Lucy, and Troup soils are contrasting soils, and their use and management differ from the Orangeburg soil. The contrasting soils make up about 10 percent of the map unit.

This Orangeburg soil is used mostly as cropland.

This soil is fairly suited to cultivated crops. If this soil is used for cultivated crops, the hazard of erosion is moderate. Slopes are generally complex, but the soil in many areas has long and smooth slopes and can be terraced and farmed on the contour. A concentration of water that does not have a proper outlet creates deep, caving gullies in this soil (fig. 12).

Figure 12.—If a concentration of water in Orangeburg sandy loam, 5 to 8 percent slopes, does not have a proper outlet, deep gullies form.

This soil is well suited to grasses and legumes for hay and pasture.

This soil is well suited to the production of loblolly pine. Longleaf pine and slash pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The understory plants are mainly little bluestem, honeysuckle, yellow jessamine, greenbrier, sumac, huckleberry, and flowering dogwood.

Moderate plant competition is a concern in managing timber on this soil. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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

This soil has slight limitations for most urban uses; however, seepage is a moderate limitation for sewage lagoons. Special treatment to seal the bottom of the lagoon can reduce this limitation. Slope is also a moderate limitation for some urban uses.

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

OrE—Orangeburg sandy loam, 8 to 20 percent slopes. This soil is deep and well drained. It is on moderately sloping to moderately steep side slopes on uplands of the Coastal Plain. Slopes are complex and convex. Individual areas of this soil are irregular in shape and range from 20 to 500 acres.

Typically, the surface layer is dark grayish brown sandy loam 5 inches thick. The upper part of the subsoil, to a depth of 28 inches, is yellowish red sandy clay loam. The middle part, to a depth of 36 inches, is yellowish red sandy clay loam that has strong brown mottles. The lower part to a depth of 60 inches is yellowish red sandy clay loam.

Important soil properties:

Permeability: moderate

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: none within a depth of 6 feet

Flooding: none

Included with this soil in mapping are small areas of Blanton, Cowarts, Lucy, Red Bay, and Troup soils. Also included are small areas of poorly drained and somewhat poorly drained loamy soils in the narrow drainageways. The included soils make up about 25 percent of the map unit, but areas of soils are generally less than 5 acres. Blanton, Cowarts, Lucy, and Troup soils are contrasting soils, and their use and management differ from the Orangeburg soil. The contrasting soils make up about 15 percent of the map unit.

This Orangeburg soil is used mostly as woodland. Cleared areas are used for pasture or hay.

This soil is not suited to cultivated crops because of steepness of slope and the severe hazard of erosion.

This soil is fairly suited to pasture and hay. If this soil is properly managed, these uses are effective in controlling erosion.

This soil is well suited to the production of loblolly pine. Longleaf pine and slash pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The understory plants are mainly little bluestem, honeysuckle, yellow jessamine, greenbrier, sumac, huckleberry, and flowering dogwood.

Moderate plant competition is a concern in managing timber on this soil. In addition, because of steepness of slope, this soil has moderate limitations for the use of equipment, and erosion is a moderate hazard. Competition by undesirable plants reduces the plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation. Management should include conservation practices to control erosion. Site preparation methods that minimize soil disturbance should be used, and tracked equipment should be used on steep slopes.

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

This soil has moderate and severe limitations for most urban uses because of steepness of slope.

This Orangeburg soil is in capability subclass VIe. The woodland ordination symbol is 9R.

OuC—Orangeburg-Urban land complex, 0 to 8 percent slopes. This complex consists of Orangeburg soil and areas of Urban land on broad, nearly level to moderately sloping ridgetops on uplands of the Coastal Plain. Areas of Orangeburg soil and Urban land are too small and intermingled to map separately. The Orangeburg soil is deep and well drained. Slopes are smooth and convex. Individual areas range from 10 to 200 acres.

The Orangeburg soil makes up about 65 percent of the map unit, and Urban land makes up about 25 percent.

Typically, Orangeburg soil has a surface layer that is dark grayish brown sandy loam about 8 inches thick. The

upper part of the subsoil is yellowish red sandy loam to a depth of 14 inches. The middle part is yellowish red sandy clay loam to a depth of 38 inches, and the lower part is red sandy clay loam to a depth of 60 inches.

Important properties of Orangeburg soil:

Permeability: moderate

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: none within a depth of 6 feet

Flooding: none

Urban land is covered by streets, parking lots, buildings, and other structures that obscured or altered the original soil.

Included in mapping are small areas of Bibb, Cowarts, Dothan, Fuquay, Lucy, and Troup soils. The included soils make up about 10 percent of the map unit, but areas are generally less than 5 acres. Bibb, Cowarts, Fuquay, and Troup soils are contrasting soils, and their use and management differ from the Orangeburg soil. The contrasting soils make up about 5 percent of the map unit.

The Orangeburg soil is used for parks, open space, building sites, lawns, and gardens.

This soil is well suited to lawns, vegetable and flower gardens, trees, and shrubs; however, if the soil is disturbed or left bare, erosion is a hazard, especially on slopes of more than 4 percent. Onsite investigation is needed to determine the erosion control measure best suited to the area.

The Orangeburg soil has slight limitations for use as sites for dwellings, recreational development, sanitary landfills, septic tank absorption fields, and local roads and streets. It has a moderate limitation for sewage lagoons because of seepage.

This complex is not assigned to a capability subclass and does not have a woodland ordination symbol.

PIT—Pits, nearly level. These miscellaneous areas are on nearly level uplands of the Coastal Plain. Slopes are smooth and slightly concave to slightly convex. Around many areas is a horseshoe-shaped wall 5 to 15 feet high. Individual areas are rectangular in shape and range from 2 to 25 acres.

Pits are open excavations from which soil and part of the underlying material have been removed for use at another location. The excavated areas left after Cowarts, Dothan, Orangeburg, and Troup soils have been removed for fill material are known locally as borrow pits, gravel pits, or sand pits. Some areas are partly filled with water during winter and spring. Most areas are reopened each year, and the adjacent soil material is removed.

Included in mapping are a few areas of Cowarts, Dothan, Orangeburg, and Troup soils. These included soils make up about 15 percent of the map unit and are covered with sparse vegetation.

These areas are primarily unused. Some areas have been planted to loblolly pine. Most areas are bare of vegetation, and the hazard of erosion is severe.

These areas are not suited to cultivated crops and are poorly suited to pasture and hay because of the low available water capacity, the very low organic matter content and natural fertility, the shallow root zone, and the soil reaction. Plant nutrients are readily leached from the root zone.

These areas are poorly suited to use as woodland. The hazard of erosion is severe, and seedling mortality is a severe limitation because of droughtiness. Trees that survive in these areas grow very slowly.

These areas have slight to severe limitations for urban uses because of the variability of the soil material. If these areas are considered for development, onsite investigation is needed.

Pits, nearly level, is not assigned to a capability subclass and does not have a woodland ordination symbol.

RaA—Rains sandy loam, 0 to 2 percent slopes. This soil is deep and poorly drained. It is on broad, nearly level or gently undulating stream terraces, upland flats, and in depressional areas on the uplands. Slopes are smooth and slightly concave. Individual areas of this soil are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is black sandy loam 5 inches thick. The subsurface layer is light brownish gray sandy loam to a depth of 14 inches. The upper part of the subsoil, to a depth of 20 inches, is light brownish gray sandy loam that has yellowish brown mottles. The lower part to a depth of 65 inches is light gray sandy clay loam that has yellowish brown mottles.

Important soil properties:

Permeability: moderate

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet for roots that can tolerate wet conditions

High water table: 0 to 1 foot below the surface, from November through April

Flooding: none

Included with this soil in mapping are small areas of Bibb, Grady, Florala, Lynchburg, Muckalee, and Osier soils. Also included are some areas of soils that have a black surface layer 6 to 15 inches thick and some areas of soils that are subject to flooding. The included soils make up about 20 percent of the map unit, but areas are generally less than 5 acres. Bibb, Florala, Muckalee, and Osier soils are contrasting soils, and their use and management differ from the Rains soil. The contrasting soils make up about 10 percent of the map unit.

This Rains soil is used mostly as woodland. In a few cleared areas, the soil is used as pasture.

This soil is poorly suited to cultivated crops because of the high water table and wetness. It is fairly well suited to pasture and hay crops. If this soil is drained, it is fairly suited to cultivated crops. Drainage also improves the soil's suitability for pasture and hay. Suitable outlets for drainage, however, are difficult to locate.

This soil is fairly suited to the production of loblolly pine and slash pine. Sweetgum and water oak are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The understory plants are mainly sweetgum, blackgum, greenbrier, gallberry, waxmyrtle, and plumegrass.

Seedling mortality and plant competition are concerns in managing timber on this soil. In addition, this soil has severe limitations for the use of equipment because of the high water table and wetness. Management activities should be limited to periods when the soil is dry. To overcome seedling mortality, trees can be planted on beds or the planting rate can be increased. Competition by undesirable plants prevents adequate natural or artificial reforestation without intensive site preparation and maintenance. Site preparation controls initial plant competition, and herbicides can control subsequent growth.

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

This soil has severe limitations for most urban uses because of the seasonal high water table and wetness. These limitations are difficult and expensive to overcome.

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

RbA—Rains-Bethera complex, 0 to 2 percent slopes, frequently flooded. The soils of this complex are deep and poorly drained. They formed in loamy and clayey alluvium. They are on broad flood plains and low stream terraces, mainly along Pigeon Creek, Patsaliga Creek, and the Conecuh River. The landscape is a nearly level first bottom or low stream terrace that consists mainly of poorly drained soils, with a few low ridges of moderately well drained and well drained soils. Old stream channels and sloughs dissect most areas, which are subject to frequent flooding of brief duration, mainly from November through April. Some areas of Bethera soil may be flooded for long periods. The Rains and Bethera soils are too intricately mixed to map separately. Individual areas are one-eighth to 1 mile wide and several miles long. They are 15 to several hundred acres in size.

The Rains soil and similar soils make up about 45 percent of the complex, and the Bethera soil and similar soils make up about 35 percent.

Typically, the Rains soil has a surface layer that is dark grayish brown sandy loam about 4 inches thick. The subsurface layer to a depth of 8 inches is dark grayish brown sandy loam that has grayish brown and light yellowish brown mottles. The upper part of the subsoil, to a depth of 48 inches, is gray sandy clay loam that has yellowish brown mottles. The lower part to a depth of 60 inches is light gray sandy clay loam that has many yellowish brown and yellowish red mottles and strata or pockets of sandy clay or sandy loam.

Typically, the Bethera soil has a surface layer that is dark gray fine sandy loam 5 inches thick. The subsurface layer, to a depth of 10 inches, is dark grayish brown fine sandy loam that has yellowish brown and grayish brown mottles. The next layer, to a depth of 18 inches, is light gray fine sandy loam that has light yellowish brown mottles. The upper part of the subsoil, to a depth of 42 inches, is gray sandy clay that has yellowish brown mottles. The middle part, to a depth of 56 inches, is gray sandy clay that has strong brown mottles, and the lower part, to a depth of 68 inches, is light gray sandy clay that has strong brown mottles. The next layer to a depth of 76 inches is gray sandy clay loam that has light yellowish brown mottles.

Important properties of Rains soil:

Permeability: moderate

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet for roots that can tolerate wet conditions

High water table: 0 to 1 foot below the surface, from November through April

Flooding: frequent

Important properties of Bethera soil:

Permeability: moderately slow to slow

Available water capacity: high

Reaction: strongly acid to extremely acid

Organic matter content: moderate

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet for roots that can tolerate wet conditions

High water table: 0 to 1.5 feet below the surface, from December through April

Flooding: frequent

Included with these soils in mapping are small areas of Bibb, Bigbee, Eunola, Iuka, Kalmia, and Lynchburg soils. The included soils make up about 20 percent of the map unit, but areas are generally less than 5 acres. Bibb, Bigbee, Eunola, Iuka, and Kalmia soils are contrasting soils, and their use and management differ from the Rains and Bethera soils. The contrasting soils make up about 15 percent of the map unit.

These Rains and Bethera soils are used mostly as woodland.

These soils are poorly suited to cultivated crops, hay, and pasture because of flooding and wetness.

These soils are fairly suited to the production of loblolly pine. Sweetgum and water oak are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90 on both the Rains and Bethera soils. The understory plants are mainly sweetgum, blackgum, greenbrier, gallberry, waxmyrtle, sweetbay, and plumegrass.

Because of flooding and wetness, severe limitations for use of equipment, seedling mortality, and plant competition are concerns in managing timber on these soils. Management activities should be limited to periods when the soils are dry. To overcome seedling mortality, trees can be planted on beds or the planting rate can be increased. Competition by undesirable plants prevents adequate natural or artificial reforestation without intensive site preparation and maintenance. Site preparation controls initial plant competition, and herbicides can control subsequent growth.

Rains soil has poor potential as habitat for openland wildlife and fair potential as habitat for woodland wildlife. Bethera soil has very poor potential as habitat for openland wildlife and poor potential as habitat for woodland wildlife. The potential as habitat for wetland wildlife is good on both soils.

These soils have severe limitations for most urban uses because of wetness and the hazard of flooding. These limitations are very difficult to overcome.

These Rains and Bethera soils are in capability subclass Vlw. The woodland ordination symbol is 9W for both soils.

RdB—Red Bay sandy loam, 1 to 5 percent slopes. This soil is deep and well drained. It is on nearly level or gently sloping ridgetops on the uplands of the Coastal Plain. Slopes are complex and convex. Individual areas of this soil are irregular in shape and range from 15 to 200 acres.

Typically, the surface layer is dark brown sandy loam 11 inches thick. The subsoil is dark red sandy clay loam to a depth of 60 inches or more.

Important soil properties:

Permeability: moderate

Available water capacity: moderate

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: none within a depth of 6 feet

Flooding: none

Included with this soil in mapping are small areas of Dothan, Lucy, Orangeburg, and Troup soils. Also included are soils that have a sandy clay loam surface layer. The included soils make up about 15 percent of the map unit, but areas are generally less than 5 acres. Lucy and Troup soils are contrasting soils, and their use and management differ from the Red Bay soil. The contrasting soils make up about 5 percent of the map unit.

This Red Bay soil is used mostly as cropland.

This soil is well suited to cultivated crops and to grasses and legumes for hay and pasture. If the soil is used for cultivated crops, the hazard of erosion is slight

to moderate. Slopes are generally complex, but the soil in most areas has long and smooth slopes and can be terraced and farmed on the contour. Incorporating crop residue and regularly adding other organic materials help to maintain fertility and tilth and increase water infiltration.

This soil is well suited to the production of loblolly pine. Longleaf pine and slash pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 90. The understory plants are mainly little bluestem, honeysuckle, yellow jessamine, greenbrier, sumac, huckleberry, and flowering dogwood.

Plant competition is a moderate concern in managing timber on this soil. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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

This soil has slight limitations for most urban uses; however, seepage is a moderate limitation for sewage lagoons. Special treatment to seal the bottom of the lagoon can reduce this limitation.

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

SmE—Smithdale sandy loam, 15 to 35 percent slopes. This soil is deep and well drained. It is on moderately steep and steep side slopes on uplands of the Coastal Plain. This map unit is mainly in the west-central part of the county, in the Loango area. Slopes are complex and convex. Individual areas of this soil are irregular in shape and range from 20 to 1,000 acres.

Typically, the surface layer is brown sandy loam 6 inches thick. The subsurface layer is yellowish brown sandy loam to a depth of 11 inches. The upper part of the subsoil, to a depth of 31 inches, is yellowish red sandy clay loam. The lower part, to a depth of 54 inches, is yellowish red sandy clay loam and sandy loam that has yellowish brown mottles. The next layer to a depth of 60 inches or more is strong brown sandy loam that has yellowish red, yellowish brown, and very pale brown mottles.

Important soil properties:

Permeability: moderate

Available water capacity: moderate

Reaction: strongly acid or very strongly acid

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: none within a depth of 6 feet

Flooding: none

Included with this soil in mapping are small areas of Blanton, Cowarts, Dothan, Esto, Lucy, Luverne, Orangeburg, and Troup soils. The included soils make up about 40 percent of the map unit, but areas are generally less than 5 acres. Blanton, Cowarts, Esto, Luverne, and Troup soils are contrasting soils, and their use and management differ from the Smithdale soil. The contrasting soils make up about 20 percent of the map unit.

This Smithdale soil is used mostly as woodland. Cleared areas are used for pasture or hay.

This soil is not suited to cultivated crops because of the steepness of slope and the severe hazard of erosion.

This soil is fairly suited to pasture and hay. If this soil is properly managed, these uses are effective in controlling erosion.

This soil is well suited to the production of loblolly pine. Slash pine and longleaf pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 85. The understory plants are mainly little bluestem, yellow jessamine, greenbrier, sumac, huckleberry, and flowering dogwood.

A moderate hazard of erosion and limitations for the use of equipment are concerns in managing timber on this soil because of the steepness of slope. Management activities should include conservation practices to control erosion. Site preparation methods that minimize soil disturbance are needed. Tracked equipment should be used on steep slopes. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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.

This soil has moderate and severe limitations for most urban uses because of steepness of slope.

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

TrB—Troup loamy sand, 0 to 5 percent slopes. This soil is deep, well drained, and sandy. It is on broad, nearly level or gently sloping ridgetops on uplands of the Coastal Plain. Slopes are smooth and convex. Individual areas of this soil are irregular in shape and range from 10 to 300 acres.

Typically, the surface layer is very dark grayish brown loamy sand 7 inches thick. The upper part of the subsurface layer, to a depth of 16 inches, is brown loamy sand. The middle part, to a depth of 38 inches, is yellowish brown loamy sand, and the lower part, to a

depth of 47 inches, is yellowish red loamy sand. The subsoil to a depth of 52 inches is red sandy loam, and it is red sandy clay loam to a depth of 80 inches.

Important soil properties:

Permeability: rapid in the surface and subsurface layers and moderate in the subsoil

Available water capacity: very low to low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: none within a depth of 6 feet

Flooding: none

Included with this soil in mapping are small areas of Blanton, Cowarts, Lucy, Orangeburg, and Red Bay soils. Also included are soils that have a fine sand surface layer. The included soils make up about 20 percent of the map unit, but areas are generally less than 5 acres. Cowarts, Orangeburg, and Red Bay soils are contrasting soils, and their use and management differ from the Troup soil. The contrasting soils make up about 10 percent of the map unit.

About a third of the acreage of this Troup soil has been cleared and is used for cultivated crops and as pasture.

This soil is fairly suited to cultivated crops and to grasses and legumes for pasture and hay. Droughtiness is a limitation. The leaching of plant nutrients is a concern in management, and split applications of commercial fertilizer are recommended. The hazard of erosion is slight to moderate if this soil is tilled. Terraces are not recommended on this sandy soil; however, slopes are mostly long and smooth and can be plowed on the contour.

This soil is well suited to the production of loblolly pine. Slash pine and longleaf pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 80. The understory plants are mainly little bluestem, longleaf uniola, lespedeza, honeysuckle, blackberry, dogwood, and tickclover.

The moderate limitations for the use of equipment, seedling mortality caused by droughtiness, and plant competition are concerns in managing timber on this soil. The thick, sandy surface layer restricts the use of wheeled equipment, especially if the soil is very dry. Management operations should be limited to periods when the soil is moist. Increasing the tree planting rate can partly overcome seedling mortality. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation to eliminate unwanted vegetation can help to control plant competition.

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.

This soil has slight limitations for most urban uses; however, seepage is a severe limitation for sewage lagoons. This soil has moderate limitations for sanitary landfills because it is too sandy, and has severe limitations for shallow excavations because cutbanks cave in.

This Troup soil is in capability subclass IIIs. The woodland ordination symbol is 8S.

TrD—Troup loamy sand, 5 to 15 percent slopes. This soil is deep and well drained. It is on narrow, moderately sloping or moderately steep side slopes on uplands of the Coastal Plain. Slopes are complex and convex. Individual areas of this soil are irregular in shape and range from 10 to 400 acres.

Typically, the surface layer is brown loamy sand about 10 inches thick. The upper part of the subsurface layer, to a depth of 30 inches, is yellowish brown loamy sand, and the lower part, to a depth of 50 inches, is pale brown sand with pockets of uncoated sand grains. The subsoil to a depth of 60 inches is yellowish red fine sandy loam and yellowish red sandy clay loam to a depth of 72 inches.

Important soil properties:

Permeability: rapid in the surface and subsurface layers and moderate in the subsoil

Available water capacity: very low to low

Reaction: strongly acid or very strongly acid except where lime has been added

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: none within a depth of 6 feet

Flooding: none

Included with this soil in mapping are small areas of Blanton, Bonifay, Cowarts, Lucy, Orangeburg, and Red Bay soils. Also included are soils that have a fine sand surface layer. The included soils make up about 20 percent of the map unit, but areas are generally less

than 5 acres. Cowarts, Orangeburg, and Red Bay soils are contrasting soils, and their use and management differ from the Troup soil. The contrasting soils make up about 10 percent of the map unit.

About a fourth of the acreage of this Troup soil has been cleared and is used for cultivated crops or pasture.

This soil is not suited to cultivated crops and is fairly suited to grasses and legumes for hay and pasture. Droughtiness is a limitation. The leaching of plant nutrients is a concern in management, and split applications of commercial fertilizer are recommended. The hazard of erosion is moderate to severe if this soil is tilled. Terraces are not recommended on this sandy soil.

This soil is well suited to the production of loblolly pine. Slash pine and longleaf pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 80. The understory plants are mainly little bluestem, longleaf uniola, lespedeza, honeysuckle, blackberry, dogwood, and tickclover.

Moderate equipment use limitations, seedling mortality caused by droughtiness, and plant competition are concerns in managing timber on this soil. The thick, sandy surface layer restricts the use of wheeled equipment, especially if the soil is very dry. Management operations should be limited to periods when the soil is moist. Increasing the tree planting rate can partly overcome seedling mortality. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

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.

This soil has moderate limitations for most urban uses because of steepness of slope. It also has severe limitations for sewage lagoons because of seepage and moderate limitations for sanitary landfills because of the sandy texture. This soil has severe limitations for shallow excavations because cutbanks cave in.

This Troup soil is in capability subclass VIs. The woodland ordination symbol is 8S.

TUE—Troup-Luverne association, 15 to 45 percent slopes. This association consists of deep and well drained soils that are in a regular and repeating pattern. Troup soil formed in sandy and loamy marine sediments, and Luverne soil formed in marine sediments deposited as stratified sand, silt, and clay. The landscape is mainly moderately steep or steep, wooded hillsides and very narrow ridgetops and drainageways. The Troup soil is on mid and upper slopes, and the Luverne soil is on mid and lower slopes. Slopes are complex and convex. The mapped areas are irregular in shape and range from 100 to 1,000 acres. Individual areas of each soil range from 10 to 100 acres.

The Troup soil and similar soils make up about 53 percent of the map unit, and the Luverne soil and similar soils make up about 35 percent.

Typically, the Troup soil has a dark grayish brown loamy sand surface layer 4 inches thick. The upper part of the subsurface layer, to a depth of 36 inches, is brownish yellow loamy sand. The lower part, to a depth of 60 inches, is strong brown loamy sand. The subsoil to a depth of 72 inches is yellowish red sandy clay loam.

Typically, the Luverne soil has a dark grayish brown sandy loam surface layer 4 inches thick. The subsurface layer is brown sandy loam to a depth of 12 inches. The upper part of the subsoil, to a depth of 28 inches, is yellowish red clay, and the lower part, to a depth of 44 inches, is yellowish red sandy clay loam. The substratum to a depth of 60 inches is strong brown sandy loam stratified with olive gray shale.

Important properties of Troup soil:

Permeability: rapid in the surface and subsurface layers and moderate in the subsoil

Available water capacity: very low to low

Reaction: strongly acid or very strongly acid

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of more than 6 feet

High water table: none within a depth of 6 feet

Flooding: none

Important properties of Luverne soil:

Permeability: moderately slow

Available water capacity: moderate

Reaction: strongly acid or very strongly acid

Organic matter content: low

Natural fertility: low

Depth to bedrock: more than 6 feet

Root zone: to a depth of 40 to 60 inches

High water table: none within a depth of 6 feet

Flooding: none

Included with these soils in mapping are small areas of Arundel, Bibb, Cowarts, Lucy, Lynchburg, and

Orangeburg soils. Also included are areas of soils that have slopes of more than 50 percent at the heads of some drainageways. Many deep, caving gullies are in this map unit. The included soils make up about 12 percent of the map unit, but areas are generally less than 5 acres. Bibb and Lynchburg soils are contrasting soils, and their use and management differ from the Troup and Luverne soils. The contrasting soils make up about 8 percent of the map unit.

These Troup and Luverne soils are used mostly as woodland.

These soils are not suited to cultivated crops nor hay and are poorly suited to improved pasture because of the steep, complex slopes, the high sand and clay content, and the very high hazard of erosion if the soils are tilled.

These soils are fairly suited to the production of loblolly pine. Longleaf pine and shortleaf pine are also grown. On the basis of a 50-year site curve, the mean site index for loblolly pine is 80 on Troup soil and 90 on Luverne soil. The understory plants are mainly little bluestem, longleaf uniola, lespedeza, honeysuckle, blackberry, dogwood, and tickclover.

The moderate hazard of erosion, limitations for the use of equipment, and plant competition are concerns in managing timber on these soils. Seedling mortality, caused by droughtiness, is also a moderate concern for Troup soil. The hazard of erosion is caused by steep slopes. Management activities should include conservation practices to control erosion. Site preparation methods that minimize soil disturbance are needed. The thick, sandy surface layer of Troup soil restricts the use of wheeled equipment, especially if the soil is dry, and the clayey subsoil of Luverne soil restricts equipment use if the soil is wet. Management activities should be limited to periods when the soil is moist. Tracked equipment should be used on steep slopes. Increasing the tree planting rate can partly overcome seedling mortality. Competition by undesirable plants reduces plant growth and adequate natural or artificial reforestation. Site preparation helps eliminate unwanted vegetation and can control plant competition.

Troup soil has fair potential as habitat for openland wildlife and poor potential as habitat for woodland wildlife. Luverne soil has fair potential as habitat for openland wildlife and good potential as habitat for woodland wildlife. The potential as habitat for wetland wildlife is very poor on both soils.

These soils have severe limitations for most urban uses because of steepness of slope, seepage in the Troup soil, and the clayey subsoil and moderately slow permeability in the Luverne soil. These limitations are difficult to overcome.

This Troup soil is in capability subclass VIIs. The woodland ordination symbol is 8R. This Luverne soil is in capability subclass VIIe. The woodland ordination symbol is 9R.

Prime Farmland

In this section, prime farmland is defined and discussed, and the prime farmland soils in Covington County 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. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, state, and federal levels, as well as individuals, must encourage and facilitate the wise use of our nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to producing food, feed, forage, fiber, and oilseed crops. Such soils have properties that are favorable for the economic production of sustained high yields of crops. The soils need only to be treated and managed using acceptable farming methods. The moisture supply, of course, must be adequate, and the growing season has to be sufficiently long. Prime farmland soils produce the highest yields with minimal inputs of energy and economic resources. Farming these soils results in the least damage to the environment.

Prime farmland soils may presently be in use as cropland, pasture, or woodland, or they may be in other uses. They either are used for producing food or fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water control structures. Public land is land not available for farming in national forests, national parks, military reservations, and state parks.

Prime farmland soils usually get an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not subject to frequent flooding during the growing season. The slope ranges mainly from 0 to 8 percent.

The following map units, or soils, make up prime farmland in Covington County. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 5. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

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

- CaA Chrysler sandy loam, 0 to 2 percent slopes, rarely flooded
- CdB Cowarts-Dothan complex, 2 to 5 percent slopes
- DmA Dothan and Malbis sandy loams, 0 to 1 percent slopes
- DmB Dothan and Malbis sandy loams, 1 to 5 percent slopes
- EuA Eunola loamy fine sand, 0 to 2 percent slopes, rarely flooded
- FoA Florala sandy loam, 0 to 3 percent slopes
- KaA Kalmia loamy fine sand, 0 to 2 percent slopes, rarely flooded
- MaA Maxton sandy loam, 0 to 2 percent slopes, rarely flooded
- OrA Orangeburg sandy loam, 0 to 1 percent slopes
- OrB Orangeburg sandy loam, 1 to 5 percent slopes
- OrC Orangeburg sandy loam, 5 to 8 percent slopes
- RdB Red Bay sandy loam, 1 to 5 percent slopes

Use and Management of the Soils

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

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

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

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

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

Michael C. Harris and Kenneth M. Rogers, conservation agronomists, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils are identified; the system of land capability classification used by the Soil Conservation Service is explained; the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the Covington County Office of the Soil Conservation Service or the Cooperative Extension Service.

In 1982, Covington County had approximately 114,000 acres of cropland and 35,000 acres of pastureland *(14)*. A small acreage in the southern section of the county produces truck crops. The acreage in cultivated crops and pasture has been decreasing slightly for several years. In most of Covington County, the trend is toward forestation of marginal farmland.

The potential is good for increased production of food and fiber in Covington County. About 100,000 acres of potential cropland is being used as woodland. If the most recent technology is applied, yields can increase on land currently under cultivation. This soil survey will help land users to make sound land management decisions and to facilitate the application of crop production technology.

Because of economic considerations, crops suited to the soils and climate of Covington County include many that are not commonly grown. Peanuts, corn, and soybeans are the main row crops. Grain sorghum, cotton, vegetables, and similar crops can be grown under favorable economic conditions.

Specialty crops include sweet corn, peas, okra, melons, tobacco, sod, and alfalfa. Dothan and Orangeburg soils are well suited to specialty crops that could be grown on a larger acreage if economic conditions were feasible. The only orchard crops grown commercially in the county are pecans and peaches (fig. 13). Wheat, rye, and oats are the only close-growing crops that are planted to produce grain; however, barley can also be grown. The offices of the Cooperative Extension Service and the Soil Conservation Service can provide information and suggestions for growing specialty crops in Covington County.

Erosion is a major concern on about 75 percent of the cropland and 50 percent of the pastureland in Covington County. If the slope is more than 2 percent, erosion is a potential hazard. Cowarts, Dothan, Malbis, Orangeburg, and Red Bay soils are sloping soils presently under cultivation.

Erosion can significantly reduce production and lead to increased pollution of streams. Eroding the surface layer

Figure 13.—Pecans are a commercial crop in Covington County. This grove is in an area of Dothan and Malbis sandy loams, 1 to 5 percent slopes.

and incorporating more of the subsoil into the plow layer reduces productivity. Losing the surface layer especially damages soils that have a clayey subsoil, such as Chrysler soils, and soils that have plinthite in the subsoil that restricts rooting depth, such as Dothan soils. Sediment from soil erosion causes offsite damage. Erosion control on farmland minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation, and for fish and wildlife.

Erosion control practices can provide protective surface cover, increased water infiltration, and reduced water runoff. A cropping system that keeps plant cover and crop residue on the land for extended periods can hold erosion losses to amounts that will not reduce the productive capacity of the soils. Legumes and forage can be incorporated into the cropping systems to reduce erosion on slopes and can help maintain tilth for the crops that follow in the rotation. Legumes can also provide nitrogen.

Using conservation tillage and leaving crop residue on the surface increase water infiltration and reduce the hazards of runoff and erosion (fig. 14). No-tillage farming of corn, soybeans, and other crops effectively reduces erosion on slopes. This practice can be adapted to most soils in Covington County.

Figure 14.—Conservation tillage is used in this area of Orangeburg sandy loam, 0 to 5 percent slopes.

Terraces and diversions control runoff and reduce erosion. They are most practical on deep, well drained, and sloping soils, such as some of the Dothan, Malbis, Orangeburg, and Red Bay soils. Blanton, Bonifay, Lucy, Fuquay, and Troup soils are not suitable for terracing because these sandy soils are subject to severe gully erosion if a concentration of water is on the surface. Grassed waterways or underground tile outlets safely drain concentrated water from soils on which terraces and diversions have been installed. Diversions intercept surface runoff from hilly uplands and divert the water around fields to vegetated disposal areas.

If used in conjunction with a water disposal system, contour farming reduces erosion on cultivated cropland. This practice is more suitable on soils that have smooth, uniform slopes, such as Dothan and Orangeburg soils.

Early in spring, soil blowing is a hazard on most soils on uplands. Strong winds will erode dry soil surfaces that are not protected by plant cover, generally after the seedbed has been prepared, after planting, and when crop plants are small. Tillage practices that leave crop residue on the surface reduce soil blowing. If residue is not left to protect the soil from wind erosion, tillage practices that roughen the soil are effective for short periods. Strips of close-growing crops are also effective windbreaks. Land preparation should be delayed, if possible, until after March, which generally is windy. The Covington County office of the Soil Conservation Service

can provide information on the design of erosion control practices.

Covington County has adequate rainfall for crops grown locally, and prolonged droughts are rare. However, rainfall distribution during spring and summer generally is such that periods of drought occur during the growing season of most years. Irrigation reduces plant stress during periods of drought. Most soils commonly used for cultivated crops are suited to irrigation; however, Arundel, Chrysler, and Esto soils have a slow infiltration rate that limits irrigation potential.

Most soils that are used for crops in Covington County have a sandy loam surface layer that is low in organic matter content. Crop residue left on the soil, manure, and other organic material can improve soil structure and reduce crust formation, thereby improving the infiltration of water.

The use of heavy tillage equipment results in compaction of subsurface layers in most soils. These plowpans or traffic pans are normally at a depth of 2 to 12 inches and restrict infiltration of water and growth of plant roots. Soils that are likely to develop traffic pans include Dothan, Fuquay, Lucy, Malbis, Orangeburg, and similar soils.

Tilth is an important factor in plant growth, and it influences the infiltration of water into the soil. Soils that have good tilth have sufficient organic matter and a granular surface layer. The type of crop, past farming operations, and the degree of erosion affect tilth. Practices that maintain organic matter content are needed for all soils used as cropland.

Soil fertility is naturally low in most soils in Covington County. All soils in the county need applications of agricultural limestone to neutralize soil acidity. Crops on all soils in the county respond well to fertilizer. Available phosphorus and potash levels are generally low in most of the soils. However, some fields can have a phosphorus or potassium build-up because high rates of commercial fertilizer have been applied to the soil in the past. Applications of lime and fertilizer should be based on the results of soil tests.

Leaching is a problem on sandy soils, such as Blanton, Bonifay, Fuquay, Lucy, and Troup soils. If high rates of nitrogen are used on these sandy soils, split applications should be applied. The Cooperative Extension Service can help to determine what kinds and amounts of fertilizer and lime can be applied.

Wetness is a problem on Bethera, Florala, Lynchburg, Muckalee, and Rains soils. Bethera, Muckalee, and Rains soils are naturally too wet for crops and pasture plants that are commonly grown in Covington County. Surface drainage systems can reduce the harmful effects of excess water on the surface of these soils. Subsurface drainage systems on Florala and Lynchburg soils reduce internal wetness and increase production of crop and pasture plants.

Pasture and hay crops are important in this county. Bahiagrass and hybrid bermudagrass are the main perennial grasses. Rye, ryegrass, oats, and wheat are grown for annual cool-season grass forages. Millets, sorghums, and hybrid forage sorghums provide most of the annual warm-season forages. Normally, these annuals grow on cropland for temporary grazing. Arrowleaf clover, crimson clover, ball clover, and other cool-season forage legumes can grow on most soils in the county, especially if proper amounts of limestone are applied. Alfalfa, a warm-season legume, grows well on well drained soils, such as Dothan, Malbis, and Orangeburg soils.

Management practices, including proper grazing, weed control, proper fertilizing, rotation grazing, and scattering animal droppings are needed on soils that produce pasture grass and hay. Florala, Lynchburg, and Rains soils are better suited to summer grazing because of wetness during the winter and early in spring. Overgrazing, low amounts of fertilizer, and soils that are high in acid are the greatest concerns in pasture production. Any of the these concerns result in weak plants and poor stands that are quickly infested with weeds. The best way to prevent establishment of weeds is to maintain a good, dense ground cover with the desired pasture plants.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

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

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that insures 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 table 6 are grown in the survey area, but estimated yields are not listed

because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for use as cropland. 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. These levels are defined in the following paragraphs.

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

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

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

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless a 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.

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

The acreage of soils in each capability class and subclass is shown in table 7. The capability classification of each map unit is given in the section "Detailed Soil Map Units" and shown in table 6.

Woodland Management and Productivity

Jerry L. Johnson, forester, Soil Conservation Service, helped prepare this section.

Covington County has 457,400 acres, or 69 percent of the county, in commercial forest land. Forest acreage increased about 2 percent from 1972 to 1982. The increase was the result of trees planted on marginal cropland and reforestation of idle land. Approximately 62 percent of the forest land in the county is privately owned, while industry owns 30 percent, and the other 8 percent is National Forest *(15)*.

The following forest types are in Covington County: 154,000 acres of longleaf pine-slash pine, 111,300 acres of loblolly pine-shortleaf pine, 49,400 acres of oak-pine, 80,400 acres of oak-hickory, and 55,600 acres of oak-gum-cypress. About 6,200 acres in the county is nonstocked forest land. Forests in Covington County have 142,200 acres of sawtimber, 123,600 acres of poletimber, and 185,400 acres of seedlings and saplings *(15)*.

Hardwoods grow best in bottom land areas adjacent to streams. Hardwoods growing on sites where they are not suited make poor quality trees. Covington County has 395,600 acres that are best suited to pine and 61,800 acres that are best suited to hardwoods *(15)*. Approximately 98 percent of the total acreage of forest land in the county has a site index of 80 or above for loblolly pine.

In Covington County, the value of forest products at the first primary processing point was 10,711,000 dollars in 1985. Forestry accounted for 20 percent of the total revenue of forest and agricultural commodities *(4, 7)*.

Soils vary in their ability to produce trees. Depth, fertility, texture, and the available water capacity influence tree growth. Elevation, aspect, and climate determine the kinds of trees that can grow on a site. Available water capacity and depth of the root zone are major influences of tree growth. Elevation and aspect are of particular importance in mountainous areas.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to fertilization than others, and some are more susceptible to landslides and erosion after roads are built and timber is harvested. Some soils require special efforts to reforest. In the section "Detailed Soil Map Units," each map unit in the survey area suitable for producing timber presents information about productivity, limitations for harvesting timber, and management concerns for producing timber. The common forest understory plants are also listed. Table 8 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate*, and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

The first tree listed for each soil under the column "Common trees" is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

Table 8 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation for use and management. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *C* indicates a soil that has a limitation because of the kind or amount of clay in the upper part of the soil. The letter *S* indicates a dry, sandy soil. The letter *A* indicates a soil that has no significant restrictions or limitations for forest use and management. If a soil has more than one limitation, the priority is as follows: W, C, and S.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation activities or harvesting operations expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of *moderate* or *severe* indicate the need for construction of higher standard roads, additional maintenance of roads, additional care in planning of harvesting and reforestation operations, or use of specialized equipment.

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, stoniness, or susceptibility of the surface layer to compaction. As slope gradient and length increase, it becomes more difficult to use wheeled equipment. On the steeper slopes, tracked equipment must be used. On the steepest slopes, even tracked equipment cannot operate; more sophisticated systems are needed. The rating is *slight* if equipment use is restricted by soil wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are steep enough that wheeled equipment cannot be operated safely across the slope, if soil wetness restricts equipment use from 2 to 6 months per year, if stoniness restricts ground-based equipment, or if special equipment is needed to avoid or reduce soil compaction. The rating is *severe* if slopes are steep enough that tracked equipment cannot be operated safely across the slope, if soil wetness restricts equipment use for more than 6 months per year, if stoniness restricts ground-based equipment, or if special equipment is needed to avoid or reduce soil compaction. Ratings of *moderate* or *severe* indicate a need to choose the most suitable equipment and to carefully plan the timing of harvesting and other management operations.

Ratings of *seedling mortality* refer to the probability of death of naturally occurring or properly planted seedlings of good stock in periods of normal rainfall as influenced by kinds of soil or topographic features. *Seedling mortality* is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth and duration of the water table, rock fragments in the surface layer, rooting depth, and the aspect of the slope. Mortality generally is greatest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of *moderate* or *severe* indicate that it may be necessary to use containerized or larger than usual planting stock or to make special site preparations, such as bedding, furrowing, installing surface drainage, or providing artificial shade for seedlings. Reinforcement planting is often needed if the risk is *moderate* or *severe*.

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. *Plant competition* becomes more severe on the more productive soils, on poorly drained soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants reduces adequate natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants reduces natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensively prepared and maintained. A *moderate* or *severe* rating indicates the need for site preparation to ensure the development of an adequately stocked stand.

Managers must plan site preparation measures to ensure reforestation without delays.

The potential productivity of *common trees* on a soil is expressed as a *site index*. Common trees are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate.

The soils that are commonly used to produce timber have the yield predicted in cubic feet and board feet. The yield is predicted at the point where mean annual increment culminates. The productivity of the soils in this survey is mainly based on the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked stands of loblolly pine *(3)*.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years. This index applies to fully stocked, even-aged, unmanaged stands.

The *productivity class* represents an expected volume produced by the most important trees, expressed in cubic feet per acre per year. Cubic feet per acre can be converted to board feet by multiplying by a factor of about 5. For example, if the soil can be expected to produce 110 cubic feet per acre per year at the point where mean annual increment culminates, about 550 board feet per acre per year can be expected to be produced.

Trees to plant are those that are used for reforestation or, if suitable conditions exist, natural regeneration. They are suited to the soils and will produce a commercial wood crop. Desired product, topographic position (such as a low, wet area), and personal preference are three factors of many that can influence the choice of trees to use for reforestation.

Woodland Grazing

Woodland makes up about 69 percent of Covington County. The major forest types are longleaf pine-slash pine, loblolly pine-shortleaf pine, oak-pine, oak-hickory, and oak-gum-cypress. Hardwood forests produce a negligible quantity of livestock forage *(10)*, and seasonal competition with wildlife is possible with moderate grazing *(6)*. The hardwood understory is a deterrent to forage production in the loblolly pine-shortleaf pine forest type *(6)*.

Planting pine trees in a good stand of bahiagrass is a practice that effectively produces both grass and trees (fig. 15). The carrying capacity of the grass is reduced very little, and the trees grow vigorously.

The longleaf pine-slash pine forest type in the southern part of Covington County makes up about 34 percent of the county and is characterized by an understory of bluestem and other plants. It is the most productive forest type in terms of forage, with herbage yields and composition directly influenced by overstory canopy. The denser the canopy, the lower the forage production. Livestock grazing programs can utilize this forage without harming the timber crop *(9)*.

Changes in plant composition and forage yields are primarily attributed to the amount of sunlight that reaches the forest floor at different seasons. Three canopy classes are adequate for planning conservation programs for woodland grazing. These classes used in grouping vegetative production are sparse, with 1 to 35 percent shade; medium, with 36 to 55 percent shade; and dense, with 56 to 70 percent shade. Warm-season, non shade-tolerant plants are dominant under medium to sparse forest canopies, and cool-season, shade-tolerant plants are dominant as the forest canopy becomes dense.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced in woodland are closely related to the kind of soil and management. Prescribed burning is an essential management practice that increases and helps to maintain forage yields under forest canopies.

Table 9 shows the characteristic understory plants, grazing value, and the total annual potential production of understory vegetation in sparse, medium, and dense canopy classes for selected detailed soil map units. Only those soils suited to woodland grazing are listed.

Understory plants are the grasses, forbs, and shrubs that make up most of the potential natural plant community of each soil. Each plant is listed by its common name. Grazing value indicates the value of an understory plant for grazing by cattle and deer. Forage yield, indicated in pounds per acre, is the total annual yield per acre of air-dry vegetation. Yields are adjusted to a common percentage of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as exposure, amount of shade, recent rainfalls, and unseasonable dry periods.

Woodland grazing management requires a knowledge of the soil and the potential natural plant community, as well as an evaluation of the present condition. Condition is determined by comparing the present plant community with the potential natural plant community on a particular map unit. The more closely the present plant community resembles the potential community, the better the condition. Condition is an ecological rating only, and does not have a specific meaning that pertains to the present plant community in a given use.

The objective in woodland grazing management is to control grazing so that the plants growing on a site are about the same kind and amount as the potential natural plant community for that site. Such management generally results in optimum production of vegetation, reduction of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, a condition somewhat below the potential can meet

Figure 15.—These pine trees are in a stand of bahiagrass on Fuquay loamy fine sand, 0 to 5 percent slopes.

grazing needs, provide wildlife habitat, and protect soil and water resources.

Recreation

In table 10, the soils of the survey area are rated according to the 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 sewerlines. The capacity of the soil to absorb septic tank effluent and the

ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 10, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 10 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 13 and interpretations for dwellings without basements and for local roads and streets in table 12.

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 gentle 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, 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 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, Soil Conservation Service, helped prepare this section.

Because of Covington County's geographic location, climate, land use, and other characteristics, it supports a variety of game animals, nongame wildlife, and furbearers. Common game animals are bobwhite quail, cottontail rabbit, various species of ducks, gray squirrel, mourning dove, white-tailed deer, and wild turkey. Common nongame wildlife includes armadillo, blackbird, bluebird, blue jay, cardinal, crows, egrets, herons, meadowlark, mockingbird, sparrows, snakes, thrushes, vireos, warblers, and woodpeckers. Common furbearers include beaver, bobcat, foxes, 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 11, the soils in Covington County 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 flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, soybeans, wheat, sorghum, oats, barley, millet, cowpeas, and sunflower.

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

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are dewberry, blackberry, croton, pokeweed, partridge pea, crabgrass, paspalum, goldenrod, and beggarweed.

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, the available water capacity, and wetness. Examples of these plants are oak, yellow poplar, cherry, sweetgum, hawthorn, dogwood, hickory, persimmon, sassafras, sumac, viburnum, holly, beech, and hackberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn olive, crabapple, dogwood, holly, and pyracantha.

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, cattails 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, beaver ponds, and other wildlife 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. The wildlife attracted to these areas include bobwhite quail, mourning dove, mockingbird, killdeer, blackbird, meadowlark, field sparrow, cottontail, 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, warblers, vireos, woodpeckers, squirrels, gray fox, raccoon, and deer.

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, rails, kingfishers, muskrat, mink, otter, turtles, and beaver.

Aquaculture

H.D. Kelly, biologist, Soil Conservation Service, helped prepare this section.

Aquaculture is the controlled production and harvest of animals or plants growing in or upon water. In Covington County, catfish farming (channel catfish) and sport fish production (bass and bream) are the most widely practiced segments of aquaculture. The channel catfish is produced either in cages in ponds or in open ponds, which is the most common method used in the county. Pond culture of catfish currently exceeds 200 acres, and more than 3,600 acres of bass and bream ponds are in the county.

Other species of fish are now being studied for pond production, and the future growth of fish farming promises to be an excellent source of additional income for those who possess land that has suitable physical features. Ponds are the foundation for fish farming, thus the soils will determine the success of fish farming or other aquacultural practices.

The soils of Covington County are named or otherwise grouped, and the known qualities or characteristics of each soil are described and displayed in tables, which indicate soil use limitations. These tables are useful in selecting pond sites. In table 15 are limitations for pond or reservoir areas and for embankments, dikes, or levees. Indications of flooding frequency and water table levels are in table 18. These tables and a soil map can help in evaluating a selected location for its pond-building and water-retaining potential. Map units, however, can also include soils that are not alike.

Knowledge of soil characteristics and pond design and construction is important in determining a pond site's true potential. The Dothan, Malbis, Cowarts, Bethera, and Grady soils are generally good soils for pond construction.

Access and building construction are important considerations in evaluating the site for pond construction. Depending upon the size and planned use of the site, road systems must be planned to accommodate harvest trucks, large trucks for commercial operations, and smaller trucks for fingerling farms. Feed trucks or similar equipment also need suitable access to the fish farm. If the farm is planned for fingerling production, a hatchery building will probably be on the site. Other buildings to store equipment and feed may be needed. The limitations of the soil for roads or building sites are in table 12.

Another factor of aquaculture is the way in which the quality of water in the ponds is influenced by the soil. Several variables of water quality affect the production of fish. Total alkalinity is one that is directly influenced by the soil. Total alkalinity values of 30 to 50 parts per million are preferred. Fish production can be acceptable in ponds of low alkalinity values, less than 20 parts per million, if the fish are well fed. Other complicating factors, however, affect fish production when alkalinity values are below 20 parts per million. Agricultural lime can often prevent production problems associated with low alkalinity values. Soil analysis of the pond basins should be made before they are limed and filled with water. The amount of lime is based upon the results of the analysis and is best applied before water is introduced into the ponds. Thereafter, annual applications of lime, even in ponds full of water, should range from 20 to 25 percent of that originally applied to maintain desirable levels of alkalinity. The value of proper alkalinity levels in fish culture cannot be overemphasized. All soils in Covington County that are suitable for pond construction will require applications of lime.

The selection and evaluation of good sites upon which to build a pond or a fish farm are only the beginning of the fish farming process. The source and amounts of water must be considered. For example, if runoff water is to be used, the watershed must also be evaluated. The local Soil Conservation Service or Cooperative Extension Service office can provide sources of technical assistance in solving site and production problems.

Fish farming requires money and hard work and should be evaluated from the standpoint of diversifying the use and conservation of soil and water resources, as well as providing some income for the landowner.

Landscaping and Gardening

Kenneth M. Rogers and Michael C. Harris, conservation agronomists, Soil Conservation Service, helped prepare this section.

The primary land uses in residential areas are as homesites and for driveways and streets. The rest of these areas are commonly used for trees; shrubs; vegetables or flowers; orchards for fruits and nuts; recreation activities; as habitat for animals and birds; and as septic tank absorption fields. Plant cover can prevent erosion and enhance the appearance of the home. Plants and shrubs can abate undesirable noise and wind, and shade trees help to conserve energy. Because residents use outdoor areas for these purposes, careful planning and an understanding of the soil are needed for land use around the home.

This section has general soil-related information for landscaping and gardening around homesites. The Cooperative Extension Service, Soil Conservation Service, and private lawn, garden, nursery, fertilizer, and seed businesses can provide other information. Because the information needed for some areas is too detailed and is beyond the scope and map scale of this survey, onsite investigation is recommended.

Most of the soils in the residential areas of Covington County have been disturbed to some degree during the construction of houses, streets, driveways, and utility services. These disturbances involve cutting and filling, grading, and excavating. As a result, soil properties are more variable and less predictable than they would be in their natural state. Onsite examination is necessary in planning land use for disturbed soils.

Areas of the Chrysler, Cowarts, and Esto soils that have had the surface layer removed when the soil was graded are some of the poorest media for plant growth. The exposed subsoil is dense and firm, and it restricts root penetration, absorbs little rainfall, and causes excessive runoff. These conditions are common where these and similar soils are mapped as a complex with Urban land. Incorporating organic matter into the soil improves tilth and infiltration and makes a more desirable rooting medium. Soils that are subject to intensive root traffic should be covered with a mulch, such as pine bark, wood chips, gravel, or similar material.

Lynchburg and Rains soils are wet, and plants on these soils need to be tolerant of high moisture. One way to minimize the effect of wetness is to install underground tile drains in permeable soils to lower the water table.

Bibb and Muckalee soils are on flood plains. Most garden and landscape plants can grow on these soils; however, the effects of floodwater on these plants should be considered. Drainage is a concern because urban use results in surface runoff that increases the frequency and amount of flooding in urban watersheds. The Soil Conservation Service, municipal and county

engineering departments, and private engineering companies can provide advice and assistance in solving drainage problems.

Blanton, Bonifay, Fuquay, Lucy, and Troup soils are sandy and have a very low available water capacity. The droughtiness of these soils limits the kinds of plants that grow unless irrigation is provided. These soils are also naturally low in organic matter content and essential plant nutrients. They need the addition of organic matter to increase the available water capacity and to retain the nutrients in the root zone. Supplemental water and split application of plant nutrients are needed. In most cases, adding a mulch, such as pine bark, wood chips, pine straw, or similar materials, or incorporating peat moss or well rotted manure can provide a more desirable medium for plant growth.

Natural fertility is low, and reaction is strongly acid or very strongly acid in most soils in Covington County. The addition of ground limestone to neutralize acidity is necessary on most soils. The surface layer has the most plant nutrients and the most favorable pH for the majority of plants. In many areas, lime and fertilizer increase the fertility of the surface layer. If the surface layer is removed during construction, the underlying soil is very acid and extremely low in plant nutrients. Many nutrients are also unavailable for plant growth in acid soil. Disturbed soils generally need larger amounts of lime and fertilizer. Lime and fertilizer should be applied according to soil test recommendations and the type of plants grown. The Cooperative Extension Service, Soil Conservation Service, and many fertilizer businesses can provide information on sampling for soil testing.

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

The propagated plants generally are planted as sprigs, plugs, or solid sodding. Topsoil can be applied before planting. Lime and fertilizer should also be applied and incorporated into the soil. The plants should be placed in close contact with the soil. The plantings should be watered so that the root system becomes well established. St. Augustinegrass, centipedegrass, and strains of zoysiagrass have moderate shade tolerance; however, St. Augustinegrass and zoysiagrass normally require more maintenance than other grasses. The strains of hybrid bermudagrass are fast growing but do not have the shade tolerance of the other grasses.

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

Short-term plant cover protects the soil at construction sites or provides soil cover between the planting seasons of the desired grasses. The most common grasses for short-term cover are ryegrass for cool seasons and sudangrass or millet for warm seasons. These annuals die after the growing season.

Lime and fertilizer should be periodically applied on all types of grasses according to recommendations based on soil test results.

Vines are also important plant cover in moderately shaded areas and on steep slopes that cannot be mowed. Ivy and periwinkle can be used as ground cover, and ivy can also be used on walls and fences. These plants propagate generally from potted plants or sprigs.

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

Shrubs are used primarily to enhance the appearance of homesites and also to control traffic in areas that do not tolerate traffic or where traffic is not desired. Shrubs can effectively dissipate energy from rains and runoff from roofs of houses. Most native and adapted plants add variety to residential settings. Reaction to acidity and fertility levels varies greatly among shrub types.

Vegetable and flower gardens are important to many individuals and businesses; however, the areas where homes and businesses are located may not be on soils suited to vegetables and flowers. Unless topsoil is applied, productivity on soils that have been disturbed by construction can be limited. Soils that have slope of more than 8 percent have poor potential for vegetable gardens because of the hazard of erosion if the soils are tilled. Soils on steep slopes generally have a thin surface layer. However, flower gardens are possible on steep slopes if mulches that help to control erosion are used. If composted tree leaves and grass clippings have been incorporated into gardens, the soil generally is fertile, friable, and has good moisture content. Additional information on vegetable crops is included in the "Crops and Pasture" section of this survey.

The Extension Service, Soil Conservation Service, and private landscaping and gardening businesses can provide further information on plants used in landscaping and gardening.

Most garden plants grow best in soils that are medium acid or slightly acid. The fertility level should be high. A soil test can effectively determine how much and what type of fertilizer to apply. The Cooperative Extension

Service, Soil Conservation Service, or retail fertilizer businesses can provide soil test information.

Trees are important in homesite landscaping. Information on soil and tree relationships is in the section "Woodland Management and Productivity." The Alabama Forestry Commission can provide special assistance in urban forestry.

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. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet, and 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 must be considered in planning, in site selection, and in design.

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

This information can be used to: 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 12 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 the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. Depth to a high water table, depth to bedrock or to a slowly

permeable layer, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

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

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, depth to a high water table, depth to bedrock or to a slowly permeable layer, and the available water capacity in the upper 40 inches 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 13 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and that 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, depth to 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.

Table 13 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, depth to a high water table, depth to bedrock, flooding, large stones, and content of organic matter.

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

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

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground

water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 13 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, and soil reaction affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

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

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

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

Construction Materials

Table 14 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

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

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

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

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

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

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

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

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

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are 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 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 or stones, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and releases a variety of plant-available nutrients as it decomposes.

Water Management

Table 15 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 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 the restrictive features that affect each soil for 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 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, a high content of stones or boulders, or a high content of organic matter. 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 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; and subsidence of organic layers. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a slowly permeable layer, 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 aluminum. 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 and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect 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 aluminum, 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. These results are reported in table 21.

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

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

Engineering Index Properties

Table 16 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

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

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

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

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

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

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. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 21.

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

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an 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.

Physical and Chemical Properties

Table 17 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, or component, 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 influence the soil's adsorption of cations, moisture retention, 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 movement of water through the soil when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage in each major soil layer is stated in inches of water per inch of soil. 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 change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These 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 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

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

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

In table 17, 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 of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 18 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

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

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

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

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

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 18 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (there is a near 0 to 5 percent chance of flooding in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (there is a 5 to 50 percent chance of flooding in any year). *Frequent* means that flooding occurs often under normal weather conditions (there is more than a 50 percent chance of flooding in any year). *Common* is used when classification as occasional or frequent does not affect interpretations. Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. November-May, for example, means that flooding can occur during the period November through May. About two-thirds to three-fourths of all flooding occurs during the stated period.

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

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

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 18 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 highest. A water table that is seasonally high for less than 1 month is not indicated in table 18.

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.

The two numbers in the "High water table-Depth" column 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 the water table exists 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 specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. Table 18 shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Not shown in the table is subsidence caused by an imposed surface load or by the withdrawal of ground water throughout an extensive area as a result of lowering the water table.

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

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

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and the 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 19 and the results of chemical analysis in table 20. The data are for soils sampled at carefully selected sites. The pedons are typical of the series and 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 oven-dry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods *(5)*.

Sand—(0.05-2.0 mm fraction) weight percentages of materials less than 2 mm (3A1).

Silt—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all materials less than 2 mm (3A1).

Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of materials less than 2 mm (3A1).

Extractable acidity—method of Hajek, Adams, and Cope.

Cation-exchange capacity—sum of cations (5A3a).

Base saturation—method of Hajek, Adams, and Cope.

Reaction (pH)—1:1 water dilution (8C1a).

Extractable bases and base saturation were determined after the method of Hajek, Adams, and Cope.

Engineering Index Test Data

Table 21 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." The soil samples were tested by the Alabama Highway Department Bureau of Materials and Tests, Montgomery, Alabama.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are: AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(13)*. 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 on laboratory measurements. Table 22 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

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

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. 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. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, slope, and soil reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, siliceous, nonacid, thermic Typic Hapludults.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. There can be some variation in the texture of the surface layer or of the substratum within a series. An example is the Cowarts series, which is a member of the fine-loamy, siliceous, thermic family of Typic Hapludults.

Soil Series and Their Morphology

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

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual (12)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (13)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

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

Arundel Series

The Arundel series consists of moderately deep, well drained, very slowly permeable soils on uplands of the Coastal Plain. These soils formed in clayey fossiliferous marine sediments. Slopes range from 8 to 25 percent.

Arundel soils are associated on the landscape with Luverne, Orangeburg, and Troup soils. Luverne soils have a stratified sandy and clayey substratum. Orangeburg soils have a fine-loamy control section more than 60 inches thick. Troup soils have a sandy epipedon more than 40 inches thick.

Typical pedon of Arundel loamy fine sand, 8 to 25 percent slopes; in a wooded area, 1,900 feet south and 600 feet west of the northeast corner of sec. 2, T. 6 N., R. 14 E.

A—0 to 6 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak fine granular structure; very friable; many fine roots; about 4 percent, by volume, rock fragments 0.5 inch to 2 inches in diameter; strongly acid; clear smooth boundary.

Bt1—6 to 14 inches; yellowish red (5YR 4/6) clay; moderate medium subangular blocky structure; friable, very sticky; many fine and medium roots; broken distinct clay films on faces of peds; extremely acid; clear wavy boundary.

Bt2—14 to 21 inches; mottled yellowish red (5YR 5/6) and pale olive (5Y 6/3) clay; weak to moderate medium subangular blocky structure; friable, very sticky; common fine roots; continuous distinct clay films on faces of peds; extremely acid; clear wavy boundary.

Bt3—21 to 30 inches; pale olive (5Y 6/3) clay; medium distinct yellowish brown (10YR 5/6) and brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; friable, very sticky; few fine roots; continuous distinct clay films on faces of peds; 5 percent, by volume, claystone fragments; extremely acid; clear wavy boundary.

Cr—30 to 60 inches; soft, rippable, fossiliferous claystone.

The thickness of the solum and depth to weathered bedrock range from 20 to 40 inches. Reaction is extremely acid or very strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Texture is loamy fine sand or sandy loam.

Some pedons have an E horizon that has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. Texture is sandy loam or fine sandy loam.

The Bt1 horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6; or hue of 10YR, value of 5, and chroma of 4 to 6. Texture is silty clay or clay.

The Bt2 and Bt3 horizons have hue of 2.5YR to 10YR or 5Y, value of 5 or 6, and chroma of 3 to 6. Mottles are in shades of red, brown, yellow, and gray. Texture is silty clay or clay.

The Cr horizon is soft, fossiliferous claystone that can be dug with a spade.

Bethera Series

The Bethera series consists of deep, poorly drained, moderately slowly or slowly permeable soils on stream terraces and upland flats. These soils are subject to frequent flooding of brief duration. They formed in fine textured stream or marine sediments. Slopes range from 0 to 2 percent.

Bethera soils are associated on the landscape with Bibb, Lynchburg, and Rains soils. Bibb soils are on the flood plain and have less than 18 percent clay in the 10- to 40-inch control section. Lynchburg soils are at a higher elevation than Bethera soils, have 18 to 35 percent clay in the upper 20 inches of the argillic horizon, and are better drained. Rains soils are at a similar or a slightly higher elevation and have less than 35 percent clay in the upper 20 inches of the argillic horizon.

Typical pedon of Bethera fine sandy loam, in an area of Rains-Bethera complex, 0 to 2 percent slopes, frequently flooded; 775 feet east and 1,000 feet south of the northwest corner of sec. 13, T. 6 N., R. 15 E.

A—0 to 5 inches; dark gray (10YR 4/1) fine sandy loam; weak medium granular structure; friable; many fine and medium roots; very strongly acid; clear smooth boundary.

E—5 to 10 inches; dark grayish brown (10YR 4/2) fine sandy loam; common medium distinct yellowish brown (10YR 5/4) and grayish brown (10YR 5/2) mottles; weak fine granular structure; friable; many fine and medium roots; very strongly acid; clear smooth boundary.

BEg—10 to 18 inches; light gray (10YR 6/1) fine sandy loam; common medium distinct light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable; common fine roots; extremely acid; clear smooth boundary.

Btg1—18 to 42 inches; gray (10YR 5/1) sandy clay; common medium distinct yellowish brown (10YR 5/4) mottles; weak medium and coarse subangular blocky structure; firm; few fine roots; few thin clay films on faces of peds; extremely acid; gradual wavy boundary.

Btg2—42 to 56 inches; gray (10YR 5/1) sandy clay; many medium prominent strong brown (7.5YR 5/8) mottles; weak medium and coarse subangular blocky structure; firm; few thin clay films on faces of peds; extremely acid; gradual wavy boundary.

Btg3—56 to 68 inches; light gray (10YR 6/1) sandy clay; many medium prominent strong brown (7.5YR 5/6) mottles; weak medium and coarse subangular blocky structure; firm; few thin clay films on faces of peds; extremely acid; clear wavy boundary.

BCg—68 to 76 inches; gray (10YR 5/1) sandy clay loam; many medium distinct light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable; extremely acid.

The solum is more than 60 inches thick. Reaction ranges from extremely acid to strongly acid throughout.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. Texture is fine sandy loam or sandy loam.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Texture is fine sandy loam or sandy loam. Some pedons do not have an E horizon.

The BEg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. In many pedons, this horizon has few or common mottles in shades of yellow or brown. Texture is fine sandy loam or sandy clay loam.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. Few to many mottles in shades of yellow, brown, or red are throughout the B horizon. Texture is sandy clay, clay loam, or clay.

The BCg horizon has colors similar to those of the Btg horizon. Texture is sandy clay loam or clay loam.

Bibb Series

The Bibb series consists of deep, poorly drained, moderately permeable soils on flood plains of streams. These soils are subject to frequent flooding of brief duration. Most areas of these soils are subject to scouring and uneven deposition of overwash. They formed in stratified loamy and sandy fluvial sediments. Slopes range from 0 to 2 percent.

Bibb soils are associated on the landscape with Bethera, Dorovan, Florala, Iuka, Muckalee, Osier, and Rains soils. Bethera soils have an argillic horizon that is more than 35 percent clay. Dorovan soils have an organic layer 51 or more inches thick. Florala soils have an argillic horizon that is less than 18 percent clay. Iuka soils are moderately well drained and are at a slightly higher elevation than Bibb soils. Muckalee soils are nonacid. Osier soils have a sandy C horizon. Rains soils have an argillic horizon that is 18 to 35 percent clay.

Typical pedon of Bibb loam, in an area of Muckalee, Bibb, and Osier soils, 0 to 2 percent slopes, frequently flooded; 480 feet west and 1,320 feet south of the northeast corner of sec. 33, T. 4 N., R. 17 E.

A—0 to 3 inches; dark gray (10YR 4/1) loam; few fine faint gray mottles and few fine distinct brown (10YR 4/3) mottles; weak fine granular structure; friable; very strongly acid; abrupt smooth boundary.

Oi—3 to 4 inches; undecomposed hardwood leaves, twigs, and fine roots.

A'—4 to 11 inches; gray (10YR 5/1) loam; many fine distinct dark yellowish brown (10YR 4/4) mottles; weak fine granular structure; friable; many fine and medium roots; very strongly acid; clear smooth boundary.

Cg1—11 to 20 inches; light gray (10YR 6/1) sandy loam; common medium prominent strong brown (7.5YR 5/6) mottles; weak medium granular structure; very friable; few fine roots; very strongly acid; clear wavy boundary.

Cg2—20 to 38 inches; light gray (10YR 6/1) sandy loam; massive; very friable; common thin strata of clean sand; pockets of undecomposed roots and twigs; strongly acid; gradual wavy boundary.

Cg3—38 to 65 inches; light gray (10YR 7/2) sand; single grained; loose; thin strata and pockets of partly decomposed leaves and roots; very strongly acid.

Reaction is strongly acid or very strongly acid throughout. Bedding planes are evident in the upper part of the profile to a depth of 40 inches.

The A and A' horizons have hue of 10YR or 2.5Y, value of 2 to 5, and chroma of 2 or less. If the value is 3 or less, the A horizon is less than 6 inches thick. Some pedons have brown or yellow mottles. Texture is loam, sandy loam, or loamy sand. Some pedons do not have an A' horizon.

Some pedons have an Oi horizon of undecomposed leaves, twigs, and roots.

The C horizon has hue of 10YR or 2.5Y, value of 3 to 7, and chroma of 2 or less. Strata or mottles of red, yellow, or brown are few to many. Layers in the 10- to 40-inch control section have a texture of sand, sandy loam, fine sandy loam, loam, or silt loam, and are stratified. Clay content of the 10- to 40-inch layer averages less than 18 percent.

Bigbee Series

The Bigbee series consists of deep, excessively drained, rapidly permeable soils on stream terraces. These soils are rarely flooded; however, flooding is possible under abnormal conditions. The Bigbee soils formed in coarse textured stream sediments. Slopes range from 0 to 5 percent.

Bigbee soils are associated on the landscape with Eunola, Kalmia, Lynchburg, and Maxton soils. The associated soils have a fine-loamy argillic horizon and are at a lower elevation on the terraces than Bigbee soils.

Typical pedon of Bigbee loamy sand, 0 to 5 percent slopes, rarely flooded; 1,600 feet east and 2,265 feet south of the northwest corner of sec. 2, T. 4 N., R. 15 E.

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) loamy sand; single grained; loose; many fine roots; strongly acid; clear smooth boundary.

C1—10 to 30 inches; light yellowish brown (10YR 6/4) sand; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

C2—30 to 42 inches; yellowish brown (10YR 5/6) sand; common medium distinct light gray (10YR 7/2) clean sand grains; single grained; loose; few fine roots; few fine black concretions; strongly acid; gradual wavy boundary.

C3—42 to 54 inches; yellow (10YR 7/6) sand; few medium distinct brownish yellow (10YR 6/6) mottles

and common medium distinct light gray (10YR 7/2) clean sand grains; single grained; loose; few fine roots; few fine black concretions; strongly acid; gradual wavy boundary.

C4—54 to 80 inches; very pale brown (10YR 7/3) sand; common medium distinct yellow (10YR 7/6) mottles; single grained; loose; few fine black concretions; strongly acid.

The sand or loamy sand horizons exceed a depth of 80 inches and do not have lamellae. Reaction is strongly acid or very strongly acid throughout except where lime has been added. These soils have a high water table between depths of 20 and 40 inches for about 2 weeks each year and between depths of 40 and 70 inches from 1 to 2 months each year. Texture is sand or loamy sand throughout.

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

The C1, C2, and C3 horizons have hue of 10YR, value of 5 or 6, and chroma of 4 to 8; or value of 7 and chroma of 6 or 8. In most pedons, this horizon has clean sand grains.

The C4 horizon has hue of 10YR, value of 7, and chroma of 3 or 4; or value of 8 and chroma of 1 or 2. In some pedons, this horizon has brown or yellow mottles.

Blanton Series

The Blanton series consists of deep, moderately well drained, moderately permeable soils on uplands of the Coastal Plain. These soils formed in sandy and loamy marine sediments. Slopes range from 0 to 12 percent.

Blanton soils are associated on the landscape with Cowarts, Dothan, Fuquay, Orangeburg, and Troup soils. Cowarts, Dothan, and Orangeburg soils generally are at a higher elevation than Blanton soils, have a sandy epipedon less than 20 inches thick, and have a fine-loamy argillic horizon. Fuquay soils are on the same position on the landscape as Blanton soils and have a loamy sand epipedon 20 to 40 inches thick. Troup soils are at a higher elevation, have a sandy epipedon more than 40 inches thick, and have a yellowish red or red argillic horizon.

Typical pedon of Blanton loamy fine sand, 0 to 5 percent slopes; 1,200 feet north and 100 feet west of the southeast corner of sec. 30, T. 4 N., R. 15 E.

A—0 to 6 inches; brown (10YR 5/3) loamy fine sand; weak fine granular structure; loose; many fine and medium roots; strongly acid; clear smooth boundary.

E1—6 to 21 inches; light yellowish brown (10YR 6/4) loamy fine sand; weak fine granular structure; loose; many fine and medium roots; strongly acid; gradual smooth boundary.

E2—21 to 45 inches; very pale brown (10YR 7/3) loamy fine sand; many medium distinct light yellowish brown (10YR 6/4) mottles; single grained; loose; common fine and medium roots; strongly acid; gradual smooth boundary.

E3—45 to 62 inches; light yellowish brown (10YR 6/4) fine sand; many medium distinct very pale brown (10YR 7/3) mottles; single grained; loose; common fine and medium roots; strongly acid; gradual wavy boundary.

Bt—62 to 80 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium prominent yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; patchy distinct clay films on ped faces; very strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Texture is loamy fine sand or fine sand.

The E1 and E2 horizons have hue of 10YR, value of 5, and chroma of 4 to 6; or value of 6 or 7 and chroma of 1 to 8. Most pedons have few to many pockets of clean sand grains. Texture is loamy fine sand or fine sand.

The E3 horizon has colors similar to those of the E1 and E2 horizons, or it can have hue of 10YR, value of 8, and chroma of 1 to 4. Pockets of clean sand grains are common to many. Texture is mainly fine sand but can range to loamy sand.

The Bt horizon has hue of 10YR, value of 5, and chroma of 6 to 8 and has mottles in shades of red, brown, yellow, and gray. Texture is mainly sandy clay loam but can range to sandy loam.

Bonifay Series

The Bonifay series consists of deep, well drained, moderately slowly permeable soils on uplands of the Coastal Plain. These soils formed in thick beds of sandy and loamy marine sediments. Slopes range from 0 to 10 percent.

Bonifay soils are associated on the landscape with Cowarts, Dothan, Fuquay, and Troup soils. Cowarts and Dothan soils generally are at a higher elevation than Bonifay soils and have an A horizon less than 20 inches thick. Fuquay soils are in the same position on the landscape as Bonifay soils and have a sandy epipedon 20 to 40 inches thick. Troup soils are on upper side slopes, have a yellowish red Bt horizon, and do not have plinthite.

Typical pedon of Bonifay loamy fine sand, 0 to 5 percent slopes; 2,460 feet west and 1,200 feet north of the southeast corner of sec. 20, T. 2 N., R. 15 E.

A—0 to 4 inches; dark gray (10YR 4/1) loamy fine sand; weak fine granular structure; very friable; many fine

and few medium roots; strongly acid; clear smooth boundary.

E1—4 to 14 inches; yellowish brown (10YR 5/4) loamy fine sand; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

E2—14 to 28 inches; yellowish brown (10YR 5/4) loamy fine sand; common medium distinct pockets of light gray (10YR 7/2) clean sand grains; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

E3—28 to 52 inches; brownish yellow (10YR 6/6) fine sand; coarse distinct light gray (10YR 7/2) clean sand grains and common medium distinct pale brown (10YR 6/3) mottles; single grained; loose; strongly acid; gradual wavy boundary.

Btv1—52 to 60 inches; yellowish brown (10YR 5/6) sandy loam; common fine distinct white (10YR 8/2) mottles; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay; estimated 20 percent, by volume, yellowish red (5YR 5/6) plinthite nodules; strongly acid; gradual wavy boundary.

Btv2—60 to 72 inches; mottled yellowish brown (10YR 5/6), white (10YR 8/2), and pale brown (10YR 6/3) sandy loam; weak to moderate subangular blocky structure; friable; sand grains coated and bridged with clay; estimated 5 percent, by volume, plinthite nodules; strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid except where lime has been added. Depth to a layer that has more than 5 percent plinthite ranges from 46 to 60 inches.

The A or Ap horizon has hue of 10YR, value of 4, and chroma of 1 to 3. Texture is loamy fine sand or fine sand.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. Texture is loamy fine sand or fine sand. Most pedons have few to many pockets of clean sand grains.

The Btv1 horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8, and has yellow, brown, or red mottles. The Btv2 horizon has colors similar to those of the Btv1 horizon; or it is reticulately mottled red, yellow, brown, gray, and white. Texture ranges from sandy loam to sandy clay loam. Plinthite nodules in the Btv horizon range from 5 to 25 percent, by volume. In some pedons, the Btv2 horizon is firm and compact.

Chrysler Series

The Chrysler series consists of deep, moderately well drained, slowly permeable soils on stream terraces. These soils are rarely flooded; however, flooding is possible under abnormal conditions. These soils formed in fine textured stream sediments. Slopes range from 0 to 2 percent.

Chrysler soils are associated on the landscape with Bigbee, Eunola, Kalmia, Lynchburg, and Maxton soils. Bigbee soils are at a higher elevation than Chrysler soils and are sandy throughout. Eunola, Kalmia, Lynchburg, and Maxton soils have less than 35 percent clay in the upper 20 inches of the argillic horizon. In addition, Kalmia and Maxton soils do not have mottles with chroma of 2 in the lower 24 inches of the argillic horizon.

Typical pedon of Chrysler sandy loam, 0 to 2 percent slopes, rarely flooded; 150 feet east and 2,150 feet north of the southwest corner of sec. 13, T. 3 N., R. 14 E.

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

Bt1—10 to 20 inches; strong brown (7.5YR 5/6) clay; many medium distinct pale brown (10YR 6/3) and yellowish red (5YR 4/6) mottles; strong medium subangular blocky structure; firm; many fine roots; continuous distinct clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—20 to 32 inches; mottled brownish yellow (10YR 6/8) and light brownish gray (10YR 6/2) clay; few fine distinct red (2.5YR 4/6) mottles; strong medium subangular blocky structure; firm; few fine roots; thick continuous clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt3—32 to 68 inches; mottled yellowish brown (10YR 5/6) and light gray (10YR 6/1) clay; strong medium subangular blocky structure; firm; few fine roots; thick continuous clay films on faces of peds; strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid throughout.

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

The Bt horizon has hue of 7.5YR, value of 5 or 6, and chroma of 5 or 6 in the upper part and has common to many red or brown mottles. Mottles that have chroma of 2 or less are within 30 inches of the surface. The lower part of the Bt horizon is mottled brown, red, and gray. Texture of the Bt horizon is clay or silty clay.

Cowarts Series

The Cowarts series consists of deep, well drained, moderately slowly or slowly permeable soils on uplands of the Coastal Plain. These soils formed in medium textured and moderately fine textured, unconsolidated marine sediments. Slopes range from 2 to 10 percent.

Cowarts soils are associated on the landscape with Blanton, Bonifay, Dothan, Fuquay, Lucy, Orangeburg, and Troup soils. Blanton, Bonifay, and Troup soils have a sandy epipedon more than 40 inches thick. Dothan

and Orangeburg soils have a solum more than 40 inches thick. Orangeburg soils also have a yellowish red or red Bt horizon. Fuquay and Lucy soils have a sandy epipedon 20 to 40 inches thick.

Typical pedon of Cowarts loamy sand, in an area of Cowarts-Dothan complex, 2 to 5 percent slopes; 2,000 feet south and 1,500 feet east of the northwest corner of sec. 11, T. 3 N., R. 16 E.

A1—0 to 1 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine and medium roots; extremely acid; clear smooth boundary.

A2—1 to 6 inches; dark yellowish brown (10YR 4/4) loamy sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bt1—6 to 18 inches; yellowish brown (10YR 5/6) sandy clay; weak medium subangular blocky structure; common fine and medium roots; thin patchy clay films on faces of peds; sand grains coated and bridged with clay; very strongly acid; gradual smooth boundary.

Bt2—18 to 28 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct strong brown (7.5YR 5/6) mottles and common medium prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; thin patchy clay films on ped faces; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

C—28 to 60 inches; mottled light gray (10YR 6/1), brownish yellow (10YR 6/6), strong brown (7.5YR 5/6), red (2.5YR 4/6), and yellowish brown (10YR 5/6) sandy clay loam; pockets of sandy clay and sandy loam; massive; firm; very strongly acid.

The solum ranges in thickness from 20 to 40 inches. Reaction is strongly acid or very strongly acid except where lime has been added.

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

Some pedons have an E horizon that has hue of 10YR, value of 4 to 6, and chroma of 4 to 8. Texture is loamy sand or sandy loam.

Some pedons have a BE horizon that has hue of 10YR, value of 5 or 6, and chroma of 4 to 6. Texture is sandy loam or fine sandy loam.

The Bt horizon has hue of 10YR, 7.5YR, or 5YR, value of 5 or 6, and chroma of 4 to 8. In most pedons, the lower part of this horizon has brown, gray, or red mottles. Texture is mainly sandy clay loam or clay loam but can range from sandy clay to sandy loam.

The C horizon is reticulately mottled in shades of gray, brown, yellow, and red. Texture ranges from sandy loam to sandy clay loam. Pockets or strata of coarser and finer textured material are common.

Dorovan Series

The Dorovan series consists of deep, very poorly drained, moderately permeable soils. These organic soils are in the bay areas and along streams in the southern part of Covington County. They are frequently flooded and can remain ponded for extended periods. They are saturated most of the time. The Dorovan soils formed in black, highly decomposed organic matter more than 51 inches thick. Slopes are 0 to 1 percent.

Dorovan soils are associated on the landscape with Bibb, Florala, Grady, Iuka, and Rains soils. The associated soils are mineral soils and are near the edge of the bays or along the streams.

Typical pedon of Dorovan muck, 0 to 1 percent slopes; 2,100 feet north and 50 feet east of the southwest corner of sec. 27, T. 2 N., R. 14 E.

Oe—0 to 1 inches; very dark brown (10YR 2/2) mucky peat consisting of partly decomposed leaves, roots, twigs, and pine straw; 30 percent fiber after rubbing; nonsticky; extremely acid; clear smooth boundary.

Oa1—1 to 15 inches; black (10YR 2/1) muck; common medium faint very dark brown (10YR 2/2) mottles; black after rubbing; massive; nonsticky; about 30 percent fiber unrubbed and less than 5 percent rubbed; many roots and partly decomposed limbs and twigs; extremely acid; gradual wavy boundary.

Oa2—15 to 70 inches; black (10YR 2/1) muck; black after rubbing; about 12 percent fiber unrubbed and less than 5 percent rubbed; massive; nonsticky; extremely acid.

The organic material ranges in thickness from 51 to more than 70 inches. Reaction is extremely acid throughout.

The Oe horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It has 50 to 80 percent fiber unrubbed and 20 to 40 percent rubbed. Some pedons do not have an Oe horizon.

The Oa horizon is neutral and has value of 2 or 3; or it has hue of 10YR, 7.5YR, or 5YR, value of 2 or 3, and chroma of 1 or 2. It has 10 to 30 percent fiber unrubbed and less than 10 percent rubbed. Fibers after rubbing are dominantly woody.

Dothan Series

The Dothan series consists of deep and well drained soils on uplands of the Coastal Plain. Permeability is moderate in the upper part of the solum and moderately slow in the lower part. These soils formed in medium textured and moderately fine textured, unconsolidated marine sediments. Slopes range from 0 to 10 percent.

Dothan soils are associated on the landscape with Blanton, Bonifay, Cowarts, Fuquay, Malbis, and Orangeburg soils. Blanton and Bonifay soils are at a

lower elevation than Dothan soils and have a sandy epipedon more than 40 inches thick. Cowarts and Malbis soils are in the same position on the landscape as Dothan soils. Cowarts soils have a solum 20 to 40 inches thick, and Malbis soils have more than 20 percent silt in the upper 20 inches of the Bt horizon. Fuquay soils are higher or lower on the landscape and have a sandy epipedon 20 to 40 inches thick. Orangeburg soils are at a higher elevation and have a yellowish red or red Bt horizon.

Typical pedon of Dothan sandy loam, in an area of Dothan and Malbis sandy loams, 1 to 5 percent slopes; 1,400 feet west and 1,200 feet south of the northeast corner of sec. 22, T. 3 N., R. 15 E.

A—0 to 4 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; gradual smooth boundary.

E—4 to 12 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine and medium roots; 2 percent small ironstone fragments; very strongly acid; clear smooth boundary.

Bt1—12 to 26 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; few small iron concretions; many fine roots; strongly acid; gradual wavy boundary.

Bt2—26 to 44 inches; yellowish brown (10YR 5/6) sandy clay loam; weak to moderate medium subangular blocky structure; friable; common thin patchy clay films on faces of peds; many fine roots; strongly acid; gradual wavy boundary.

Btv1—44 to 63 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium distinct dark brown (7.5YR 4/4) and yellowish red (5YR 4/6) mottles; weak or moderate medium subangular blocky structure; friable or firm; few thin patchy clay films on faces of peds; few fine roots; 7 percent plinthite nodules; strongly acid; gradual wavy boundary.

Btv2—63 to 75 inches; light yellowish brown (10YR 6/4) sandy clay loam; many medium distinct light brownish gray (10YR 6/2), strong brown (7.5YR 5/6), and yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; firm; few thin patchy clay films on faces of peds; 6 to 10 percent plinthite nodules; strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid except where lime has been added. Depth to a horizon that has 5 percent or more plinthite ranges from 36 to 60 inches.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. Texture is sandy loam or fine sandy loam.

The Ap and E horizons have hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is sandy loam or fine sandy loam. Some pedons do not have an Ap or an E horizon.

Some pedons have a BE horizon that has hue of 10YR, value of 5, and chroma of 4 to 8. Texture is sandy loam or fine sandy loam.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 6 or 8; or hue of 7.5YR, value of 5, and chroma of 6 or 8. Texture is mainly sandy clay loam but can range to sandy loam. Clay content ranges from 18 to 35 percent, and silt content is less than 20 percent in the upper 20 inches of the horizon.

The Btv horizon can have colors similar to those of the Bt horizon and have brown and red mottles; or it can be mottled in shades of yellow, red, brown, and gray. Texture is sandy clay loam but can range to sandy clay. Plinthite nodules range from 5 to 12 percent, by volume.

Esto Series

The Esto series consists of deep, well drained, slowly permeable soils on uplands of the Coastal Plain. These soils formed in fine textured, unconsolidated marine sediments. Slopes range from 2 to 8 percent.

Esto soils are associated on the landscape with Bonifay, Cowarts, Dothan, and Fuquay soils. Bonifay soils are at a lower elevation than Esto soils and have a sandy epipedon more than 40 inches thick. Cowarts and Dothan soils are in the same position on the landscape as Esto soils and have an argillic horizon that has less than 35 percent clay in the upper 20 inches. Dothan soils also have a layer that has more than 5 percent plinthite within 60 inches of the surface. Fuquay soils are at a lower elevation and have a sandy epipedon 20 to 40 inches thick.

Typical pedon of Esto sandy loam, 2 to 8 percent slopes; 1,950 feet south and 2,100 feet west of the northeast corner of sec. 32, T. 3 N., R. 14 E.

A—0 to 4 inches; dark gray (10YR 4/1) sandy loam; weak fine granular structure; friable; many fine and medium roots; very strongly acid; clear smooth boundary.

Bt1—4 to 10 inches; mottled yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), yellowish red (5YR 4/6), and light gray (10YR 7/2) clay; moderate medium subangular blocky structure; very firm; few fine roots; broken distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—10 to 30 inches; mottled yellowish brown (10YR 5/6), brown (7.5YR 4/4), red (2.5YR 4/6), and light gray (10YR 7/1) clay; moderate medium subangular blocky structure; very firm; few fine roots; broken distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—30 to 60 inches; mottled light gray (10YR 7/1), brownish yellow (10YR 6/6), and strong brown (7.5YR 5/6) clay; moderate fine and medium

subangular blocky structure; very firm; broken distinct clay films on faces of peds; very strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid except where lime has been added.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

Some pedons have an Ap horizon that has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is sandy loam or fine sandy loam.

Some pedons have a BE horizon that has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Texture is clay loam or sandy clay loam.

The Bt horizon has hue of 10YR, 7.5YR, or 5YR, value of 5 or 6, and chroma of 6 or 8, and has mottles in shades of gray, yellow, brown, and red. In some pedons, this horizon does not have a matrix color and is mottled in shades of gray, yellow, brown, and red. Texture is clay, clay loam, or sandy clay.

Eunola Series

The Eunola series consists of deep, moderately well drained, moderately permeable soils on stream terraces. These soils are rarely flooded; however, flooding is possible under abnormal conditions. The Eunola soils formed in medium textured and coarse textured stream sediments. Slopes range from 0 to 2 percent.

Eunola soils are associated on the landscape with Bigbee, Kalmia, Lynchburg, and Maxton soils. Bigbee soils generally are along the stream banks and are sandy. Kalmia and Maxton soils are at a higher elevation on the terraces than Eunola soils and are well drained. Lynchburg soils are at a lower elevation on the terraces and have mottles that have chroma of 2 or less throughout the argillic horizon.

Typical pedon of Eunola loamy fine sand, 0 to 2 percent slopes, rarely flooded; 2,000 feet south and 2,200 feet west of the northeast corner of sec. 19, T. 4 N., R. 15 E.

Ap—0 to 5 inches; very dark gray (10YR 3/1) loamy fine sand; weak fine granular structure; very friable; common fine roots; common fine pores; medium acid; abrupt smooth boundary.

Bt1—5 to 12 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; very friable; few fine roots; common fine pores; very strongly acid; gradual smooth boundary.

Bt2—12 to 24 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium prominent yellowish red (5YR 4/6) mottles and few fine faint light brownish gray mottles; weak medium subangular blocky structure; friable; thin patchy distinct clay films on faces of peds; sand grains coated and bridged with clay; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.

Bt3—24 to 44 inches; mottled yellowish brown (10YR 5/6), gray (10YR 6/1), and strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; thin patchy distinct clay films on faces of peds; sand grains coated and bridged with clay; common fine pores; very strongly acid; gradual wavy boundary.

C—44 to 60 inches; gray (10YR 5/1) stratified sandy loam and sandy clay loam; many medium distinct yellowish brown (10YR 5/6) mottles; few thin strata of uncoated sand grains; massive; very friable; very strongly acid.

The solum ranges in thickness from 40 to 60 inches. Reaction is strongly acid or very strongly acid except where lime has been added.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 to 3. Texture is loamy fine sand or loamy sand.

Some pedons have a BE horizon that has hue of 10YR or 7.5YR, value of 5, and chroma of 4 to 8. Texture is sandy loam or fine sandy loam.

The upper part of the Bt horizon has hue of 10YR, value of 5, and chroma of 4 to 8; or hue of 7.5YR, value of 5, and chroma of 6 or 8. It can be mottled in shades of red, brown, and gray. Texture is fine sandy loam or sandy clay loam. The lower part of the Bt horizon is mottled in shades of yellow, red, brown, and gray, or it can have a yellowish brown matrix that has many mottles in shades of yellow, red, brown, and gray. Texture is sandy loam or sandy clay loam.

The C horizon is mottled in shades of yellow, gray, brown, or red. Texture ranges from sand to stratified sandy loam and sandy clay loam.

Florala Series

The Florala series consists of deep, somewhat poorly drained, moderately permeable soils on uplands of the Coastal Plain. A high water table is 1.5 to 2.5 feet below the surface from December to March, and water can pond on the surface for brief periods after extended rainfall. These soils formed in medium textured marine sediments. Slopes range from 0 to 3 percent.

Florala soils are associated on the landscape with Bibb, Bonifay, Dothan, and Fuquay soils. Bibb soils are at a lower elevation than Florala soils, have dominant gray colors within 20 inches of the surface, and have bedding planes. Bonifay, Dothan, and Fuquay soils are at a higher elevation and are well drained. In addition, Bonifay soils have a sandy epipedon more than 40 inches thick, Dothan soils have more than 18 percent clay in the argillic horizon, and Fuquay soils have a sandy epipedon 20 to 40 inches thick.

Typical pedon of Florala sandy loam, 0 to 3 percent slopes; 900 feet east and 1,830 feet south of the northwest corner of sec. 28, T. 6 N., R. 20 W.

A—0 to 8 inches; dark gray (10YR 4/1) sandy loam; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.

Bt1—8 to 22 inches; yellowish brown (10YR 5/4) sandy loam; weak medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; very strongly acid; clear wavy boundary.

Bt2—22 to 36 inches; pale brown (10YR 6/3) sandy loam; common medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; sand grains coated and bridged with clay; 3 percent, by volume, plinthite nodules; very strongly acid; gradual wavy boundary.

Btv—36 to 72 inches; mottled light gray (10YR 6/1), yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), and yellowish red (5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; 8 percent, by volume, plinthite nodules; strongly acid.

The solum is more than 60 inches thick. Reaction is very strongly acid or strongly acid except where lime has been added. Depth to a horizon that has 5 percent or more plinthite ranges from 20 to 42 inches.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 or 2; or it is neutral and has value of 3 or 4. Texture is sandy loam or fine sandy loam.

Some pedons have an E horizon that has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. Texture is fine sandy loam, sandy loam, or loamy fine sand. This horizon is less than 8 inches thick.

The Bt1 horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. In some pedons, it has mottles in shades of red, brown, or yellow.

The Bt2 and Btv horizons have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 4; or they do not have a matrix color and are mottled in shades of brown, yellow, red, and gray. Mottles that have chroma of 2 or less are within 30 inches of the surface. Texture of the Bt horizon is sandy loam or fine sandy loam and ranges to sandy clay loam in the lower part of the horizon in most pedons. Silt content is less than 20 percent in the upper 20 inches of the argillic horizon. Plinthite ranges from 5 to about 20 percent, by volume, in the Btv horizon.

Fuquay Series

The Fuquay series consists of deep, well drained, slowly permeable soils on uplands of the Coastal Plain. These soils formed in thick, unconsolidated beds of loamy sand, sandy clay loam, and sandy loam marine sediments. Slopes range from 0 to 5 percent.

Fuquay soils are associated on the landscape with Bonifay, Cowarts, Dothan, and Lucy soils. Bonifay and Lucy soils are in the same position on the landscape as Fuquay soils. Bonifay soils have a sandy epipedon more than 40 inches thick, and Lucy soils have a Bt horizon that has hue of 5YR or redder. Cowarts and Dothan soils are at a higher elevation and have an A horizon less than 20 inches thick.

Typical pedon of Fuquay loamy fine sand, 0 to 5 percent slopes; 1,200 feet east and 700 feet north of the southwest corner of sec. 3, T. 3 N., R. 17 E.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak fine granular structure; very friable; many fine roots; few ironstone pebbles 0.25 to 0.75 inch in diameter; medium acid; clear smooth boundary.

E—7 to 30 inches; yellowish brown (10YR 5/4) loamy fine sand; common uncoated sand grains; single grained; many fine roots; 4 percent, by volume, ironstone pebbles 0.25 to 0.75 inch in diameter; medium acid; gradual wavy boundary.

Bt—30 to 37 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; very friable; common fine roots; 4 percent, by volume, ironstone pebbles 0.25 to 0.75 inch in diameter; 2 percent, by volume, nodular plinthite; very strongly acid; clear wavy boundary.

Btv1—37 to 52 inches; strong brown (7.5YR 5/6) sandy clay loam; weak or moderate medium subangular blocky structure; friable; few fine roots; thin patchy clay films on faces of peds; few soft brown concretions; 10 to 12 percent, by volume, nodular plinthite; strongly acid; gradual wavy boundary.

Btv2—52 to 66 inches; mottled red (2.5YR 4/6), light gray (10YR 6/1), yellowish brown (10YR 5/6), strong brown (7.5YR 5/8), and pale brown (10YR 6/3) sandy clay loam; weak medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; 10 percent, by volume, nodular plinthite; very strongly acid.

The solum is more than 60 inches thick. Reaction is medium acid to very strongly acid except where lime has been added. Depth to a horizon that has more than 5 percent plinthite ranges from 35 to 60 inches.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Texture is loamy fine sand or loamy sand.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 6. Texture is loamy fine sand or loamy sand.

The Bt horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8; or hue of 10YR, value of 6, and chroma of 6. Texture is sandy loam or sandy clay loam.

The Btv1 horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8. Mottles of red and yellow are in the lower part of some pedons. Plinthite nodules range from 5 to 12 percent, by volume. Texture is sandy clay loam.

The Btv2 horizon has hue of 5YR to 10YR, value of 4 to 8, and chroma of 3 to 8, or it is mottled. Texture is sandy clay loam. Plinthite nodules range from 5 to 15 percent, by volume.

Grady Series

The Grady series consists of deep, poorly drained, slowly permeable soils on uplands and stream terraces of the Coastal Plain. These soils formed in clayey marine sediments. They are in upland depressions and along stream courses. Slopes range from 0 to 2 percent.

Grady soils are associated on the landscape with Cowarts, Dothan, Florala, Lynchburg, Malbis, and Rains soils. The associated soils are at a higher elevation than Grady soils and have less than 35 percent clay in the control section. Cowarts, Dothan, and Malbis soils do not have gray mottles in the upper 30 inches. Florala and Lynchburg soils have higher chroma in the upper 30 inches.

Typical pedon of Grady sandy loam, 0 to 2 percent slopes, ponded; 1,200 feet east and 50 feet north of the southwest corner of sec. 36, T. 1 N., R. 18 E.

O—2 to 0 inches; black (10YR 2/1) leaves, roots, and partly decomposed organic material.
A—0 to 18 inches; dark gray (10YR 4/1) sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; gradual smooth boundary.
Btg1—18 to 34 inches; light gray (10YR 6/1) sandy clay; weak medium subangular blocky structure; friable; broken distinct clay films on faces of peds; very strongly acid; gradual smooth boundary.
Btg2—34 to 60 inches; light gray (10YR 6/1) clay; many medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; broken distinct clay films on faces of peds; very strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid except where lime has been added.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. Texture is sandy loam or loam.

The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. Few to many mottles are in shades of brown, yellow, and gray. Texture is sandy clay or clay.

Iuka Series

The Iuka series consists of deep, moderately well drained, moderately permeable soils on flood plains of streams. These soils are subject to frequent flooding of brief duration. Most areas of these soils are subject to scouring and uneven deposition of overwash. They formed in stratified loamy and sandy fluvial sediments. Slopes range from 0 to 2 percent.

Iuka soils are associated on the landscape with Bethera, Bibb, Bigbee, Florala, and Rains soils. Bibb soils are on the lowest part of the flood plain and have mottles with chroma of 2 in the upper 20 inches. Bigbee soils are on higher terraces than Iuka soils and are sandy throughout. Bethera, Florala, and Rains soils have an argillic horizon. Bethera and Rains soils also have more than 18 percent clay in the upper 20 inches of the argillic horizon.

Typical pedon of Iuka sandy loam, in an area of Iuka-Bibb sandy loams, 0 to 2 percent slopes, frequently flooded; 1,950 feet south and 1,500 feet west of the northeast corner of sec. 7, T. 2 N., R. 16 E.

A—0 to 9 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.
C1—9 to 21 inches; light olive brown (2.5Y 5/4) sandy loam; few fine faint light brownish gray mottles; weak fine granular structure; very friable; common fine roots; very strongly acid; gradual wavy boundary.
C2—21 to 29 inches; light yellowish brown (2.5Y 6/4) sandy loam; common medium faint light brownish gray (2.5Y 6/2) mottles and many medium distinct white (10YR 8/1) mottles (clean sand grains); weak fine granular structure; very friable; very strongly acid; gradual wavy boundary.
C3—29 to 34 inches; yellowish brown (10YR 5/6) sandy loam; many medium distinct light gray (10YR 6/1) and light yellowish brown (2.5Y 6/4) mottles; weak fine granular structure; very friable; very strongly acid; clear smooth boundary.
Cg—34 to 50 inches; gray (10YR 6/1) loamy sand; common medium faint light gray (10YR 7/1) mottles; structureless; single grained; very friable; very strongly acid; clear smooth boundary.
Ab—50 to 54 inches; very dark gray (10YR 3/1) sandy loam; structureless; massive; very friable; many fine roots; very strongly acid; clear smooth boundary.
Cgb—54 to 60 inches; light gray (10YR 7/1) sand; structureless; single grained; uncoated sand grains; very strongly acid.

Reaction is strongly acid or very strongly acid except where lime has been added. Thin bedding planes of contrasting textures are common in most pedons.

The A horizon has hue of 10YR, value of 4, and chroma of 2 or 3. Texture is mainly sandy loam but can range to loam, silt loam, and loamy sand.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6. Mottles that have chroma of 2 or less are within 20 inches of the surface. Texture is sandy loam, fine sandy loam, or loam.

The Cg horizon is mottled in shades of gray, brown, and yellow; or it is dominantly gray with brown and yellow mottles. Texture is sandy loam, loam, silt loam, or loamy sand.

Clay content of the 10- to 40-inch control section is 10 to 18 percent. In some pedons, texture is sand, sandy clay loam, or clay loam below a depth of 40 inches.

The Ab horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. Texture is sandy loam, silt loam, or loamy sand. Some pedons do not have an Ab horizon.

The Cgb horizon has colors similar to those of the Cg horizon. Texture is sand, sandy loam, silt loam, or loamy sand. Some pedons do not have a Cgb horizon.

Kalmia Series

The Kalmia series consists of deep, well drained, moderately permeable soils on stream terraces. These soils are rarely flooded; however, flooding is possible under abnormal conditions. The soils formed in medium textured and coarse textured stream sediments. Slopes range from 0 to 2 percent.

Kalmia soils are associated on the landscape with Bigbee, Chrysler, Eunola, Maxton, and Lynchburg soils. Bigbee soils are at a higher elevation than Kalmia soils and are sandy. Chrysler soils have more than 35 percent clay in the argillic horizon. Eunola soils are at a lower elevation and have mottles with chroma of 2 or less in the upper 24 inches of the argillic horizon. Maxton soils are at a similar elevation as Kalmia soils and have a yellowish red and red argillic horizon. Lynchburg soils are at a lower elevation and have gray mottles within 30 inches of the surface.

Typical pedon of Kalmia loamy fine sand, 0 to 2 percent slopes, rarely flooded; 650 feet south and 850 feet east of the northwest corner of sec. 15, T. 4 N., R. 15 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak fine granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

BE—8 to 12 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; few fine roots; strongly acid; clear smooth boundary.

Bt—12 to 34 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; thin patchy clay films on faces of peds; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

2C1—34 to 40 inches; brownish yellow (10YR 6/6) loamy sand; single grained; loose; very strongly acid; clear wavy boundary.

2C2—40 to 60 inches; very pale brown (10YR 8/4) sand; single grained; loose; very strongly acid.

The solum ranges in thickness from 30 to 40 inches. Reaction is strongly acid or very strongly acid except where lime has been added.

The Ap horizon has hue of 10YR, value of 4, and chroma of 2. Texture is loamy fine sand or loamy sand.

The BE horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is sandy loam or fine sandy loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 6 or 8. Texture is mainly sandy clay loam but can range to sandy loam. Silt content is less than 20 percent. Mottles that have higher or lower chroma are in the lower part of some Bt horizons.

The 2C horizon has colors similar to those of the Bt horizon. Texture is sand or loamy sand.

Lucy Series

The Lucy series consists of deep, well drained, moderately permeable soils on uplands of the Coastal Plain. These soils formed in thick, unconsolidated beds of sandy and loamy textured marine sediments. Slopes range from 0 to 5 percent.

Lucy soils are associated on the landscape with Dothan, Fuquay, Orangeburg, Red Bay, and Troup soils. Dothan, Orangeburg, and Red Bay soils have an A horizon less than 20 inches thick. Fuquay soils have a Bt horizon that has hue of 7.5YR or more yellow. Troup soils have a sandy epipedon more than 40 inches thick.

Typical pedon of Lucy loamy sand, 0 to 5 percent slopes; 1,000 feet south and 1,440 feet west of the northeast corner of sec. 4, T. 4 N., R. 18 E.

Ap—0 to 10 inches; dark brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.

E—10 to 29 inches; yellowish red (5YR 5/8) loamy sand; weak fine granular structure; very friable; common fine roots; strongly acid; gradual smooth boundary.

Bt1—29 to 35 inches; red (2.5YR 4/6) sandy loam; weak fine subangular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.

Bt2—35 to 60 inches; red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; thin patchy clay films on faces of peds; sand grains coated and bridged with clay; strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid except where lime has been added.

The Ap horizon has hue of 10YR or 7.5YR, value of 4, and chroma of 3. Texture is loamy sand.

The E horizon has hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, and chroma of 6 to 8. Texture is loamy sand. Combined thickness of the A and E horizons ranges from 20 to 40 inches.

Some pedons have a BE horizon or an EB horizon that has hue of 7.5YR, 5YR, or 2.5YR, value of 4 or 5, and chroma of 4 or 8. Texture is loamy sand or sandy loam.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. Texture is sandy loam or sandy clay loam.

Luverne Series

The Luverne series consists of deep, well drained, moderately slowly permeable soils on uplands of the Coastal Plain. These soils formed in stratified clayey and sandy marine sediments. They are on steep dissected uplands. Slopes range from 15 to 45 percent.

Luverne soils are associated on the landscape with Arundel, Orangeburg, and Troup soils. Arundel soils are at a lower elevation than Luverne soils and are underlain by fossiliferous marine sediment. Orangeburg soils are at a higher elevation and have less than 35 percent clay in the argillic horizon. Troup soils are at a higher elevation and have a sandy epipedon more than 40 inches thick.

Typical pedon of Luverne sandy loam, in an area of Troup-Luverne association, 15 to 45 percent slopes; 600 feet west and 2,400 feet north of the southeast corner of sec. 6, T. 6 N., R. 18 E.

A—0 to 4 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

E—4 to 12 inches; brown (10YR 5/3) sandy loam; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.

Bt—12 to 28 inches; yellowish red (5YR 4/6) clay; moderate to strong medium subangular blocky structure; firm; few fine roots; few mica flakes; broken distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

BC—28 to 44 inches; yellowish red (5YR 5/6) sandy clay loam; weak to moderate medium subangular blocky structure; firm; few fragments of light gray shale; few mica flakes; thin patchy distinct clay films on faces of peds; very strongly acid; gradual smooth boundary.

C—44 to 60 inches; strong brown (7.5YR 5/6) sandy loam stratified with thin layers of olive gray shale; massive; firm; shale layers 0.25 inch thick; sandy loam layers 1 inch to 5 inches thick; few mica flakes; thick clay coatings on shale plates; very strongly acid.

The solum ranges in thickness from 30 to 50 inches. Depth to hard bedrock is more than 60 inches. Reaction is strongly acid or very strongly acid.

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

The E horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Texture is sandy loam or loamy sand. Some pedons do not have an E horizon.

The Bt horizon has hue of 5YR or 2.5YR, value of 3 to 5, and chroma of 4 to 8. Some pedons have mottles in shades of brown, olive, or red. Texture is sandy clay or clay. Mica flakes range from few to many.

The BC horizon has colors similar to those of the Bt horizon. Texture is clay loam or sandy clay loam. Mica flakes range from few to many.

The C horizon is stratified marine sediments. Texture of strata ranges from sandy loam to sandy clay. Thickness of strata ranges from 0.25 inch to about 5 inches. Colors are variable, but generally the sandy strata have hue of 7.5YR, 5YR, or 2.5YR, value of 4 to 6, and chroma of 5 to 8. Shale strata are generally gray. Mica flakes range from few to many. Some pedons have thin lenses of ironstone.

Lynchburg Series

The Lynchburg series consists of deep, somewhat poorly drained, moderately permeable soils on stream terraces and upland flats. These soils are subject to ponding for brief periods late in winter and in spring. They formed in medium textured stream and marine sediments. Slopes range from 0 to 2 percent.

Lynchburg soils are associated on the landscape with Bigbee, Dothan, Eunola, Kalmia, and Maxton soils. Bigbee soils are at a higher elevation than Lynchburg soils and are sandy throughout. Dothan soils are at a higher elevation on the uplands, and Eunola soils are at a similar elevation as Lynchburg soils. The Dothan and Eunola soils do not have mottles with chroma of 2 in the upper part of the argillic horizon. Kalmia and Maxton soils are at a higher elevation and do not have gray mottles.

Typical pedon of Lynchburg sandy loam, 0 to 2 percent slopes; 800 feet south and 1,540 feet west of the northeast corner of sec. 11, T. 4 N., R. 15 E.

Ap—0 to 5 inches; very dark gray (10YR 3/1) sandy loam; weak fine granular structure; friable; many fine roots; medium acid; clear smooth boundary.

E—5 to 8 inches; brown (10YR 4/3) sandy loam; few fine distinct pale brown (10YR 6/3) and light brownish gray (10YR 6/2) mottles; weak fine

granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.
BE—8 to 16 inches; yellowish brown (10YR 5/4) sandy loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; gradual wavy boundary.
Btg—16 to 34 inches; light brownish gray (10YR 6/2) sandy clay loam; many medium distinct yellowish brown (10YR 5/4) mottles and common medium prominent strong brown (7.5YR 5/6) and yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; thin patchy faint clay films on faces of peds; very strongly acid; gradual wavy boundary.
Bt—34 to 65 inches; mottled light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) sandy clay loam with pockets of sandy loam; moderate medium subangular blocky structure; friable; patchy faint clay films on faces of peds; very strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid except 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. Texture is sandy loam or fine sandy loam.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. Light brownish gray mottles are in some pedons. Texture is sandy loam or fine sandy loam.

The BE horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4, and has few to common gray mottles. Texture is sandy loam or fine sandy loam.

The Btg horizon has hue of 10YR, value of 6, and chroma of 1 or 2, and has many brown mottles.

The Bt horizon is mottled in shades of gray and brown. Texture is mainly sandy clay loam but can range to sandy loam. In the lower part of the B horizon, texture ranges to sandy clay.

Malbis Series

The Malbis series consists of deep, well drained soils on uplands of the Coastal Plain. Permeability is moderate in the upper part of the solum and moderately slow in the lower part. These soils formed in medium textured and moderately fine textured, unconsolidated marine sediments. Slopes range from 0 to 5 percent.

Malbis soils are associated on the landscape with Blanton, Bonifay, Cowarts, Dothan, Fuquay, and Orangeburg soils. Blanton and Bonifay soils are at a lower elevation than Malbis soils and have a sandy epipedon more than 40 inches thick. Cowarts and Dothan soils are in the same position on the landscape as Malbis soils. Cowarts soils have a solum 20 to 40 inches thick, and Dothan soils have less than 20 percent silt in the upper 20 inches of the Bt horizon. Fuquay soils are higher or lower on the landscape and have a sandy epipedon 20 to 40 inches thick. Orangeburg soils have a yellowish red or red Bt horizon, are lower on the landscape in the northern part of Covington County, and are higher on the landscape in the southern part.

Typical pedon of Malbis sandy loam, in an area of Dothan and Malbis sandy loams, 1 to 5 percent slopes; 1,400 feet south and 1,300 feet east of the northwest corner of sec. 21, T. 2 N., R. 14 E.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.
Bt1—9 to 22 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure; friable; many fine and medium roots; few thin faint clay films on faces of peds; strongly acid; gradual wavy boundary.
Bt2—22 to 46 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; few fine and medium roots; few thin faint clay films on faces of peds; few small ironstone fragments; strongly acid; gradual wavy boundary.
Btv—46 to 72 inches; mottled yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), light gray (10YR 6/1), and yellowish red (5YR 4/6) sandy clay loam; weak medium subangular blocky structure; firm; thin patchy distinct clay films on faces of peds; 5 percent plinthite nodules; strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid except where lime has been added. Depth to a horizon that has 5 percent or more plinthite ranges from 36 to 56 inches.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2. Texture is sandy loam or fine sandy loam.

Some pedons have an E horizon that has hue of 10YR, value of 5 or 6, and chroma of 4. Texture is sandy loam, fine sandy loam, or loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 5, and chroma of 6 or 8. The lower part of this horizon can have mottles in shades of brown, yellow, and red. Texture is loam, clay loam, or sandy clay loam. In the upper 20 inches, silt content ranges from 20 to 35 percent and clay content ranges from 18 to 30 percent.

The Btv horizon has colors similar to those of the Bt horizon and many red, gray, or yellow mottles; or it does not have a matrix color and is mottled in shades of gray, red, brown, and yellow. Texture generally is sandy clay loam but can range to clay loam or loam. Plinthite nodules range from 5 to 25 percent.

Maxton Series

The Maxton series consists of deep, well drained, moderately permeable soils on stream terraces. These

soils are rarely flooded; however, flooding is possible under abnormal conditions. They formed in medium textured and coarse textured stream sediments. Slopes range from 0 to 2 percent.

Maxton soils are associated on the landscape with Bigbee, Eunola, Kalmia, and Lynchburg soils. Bigbee soils are at a higher elevation than Maxton soils and are sandy throughout. Eunola soils are at a lower elevation and have mottles with chroma of 2 or less in the upper 24 inches of the argillic horizon. Kalmia soils are at a similar elevation as Maxton soils and have a yellowish brown argillic horizon. Lynchburg soils are at a lower elevation and have gray mottles in the argillic horizon.

Typical pedon of Maxton sandy loam, 0 to 2 percent slopes, rarely flooded; 2,115 feet east and 850 feet north of the southwest corner of sec. 15, T. 4 N., R. 15 E.

A—0 to 5 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

E—5 to 15 inches; brown (10YR 5/3) sandy loam; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

Bt—15 to 25 inches; yellowish red (5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; common fine and medium roots; thin patchy faint clay films on faces of peds; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

BC—25 to 34 inches; yellowish red (5YR 5/6) sandy loam; weak medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

C—34 to 42 inches; strong brown (7.5YR 5/6) loamy sand; single grained; very friable; few fine roots; strongly acid; gradual wavy boundary.

2C—42 to 60 inches; yellow (10YR 7/6) sand; single grained; loose; few fine roots; strongly acid.

The solum ranges in thickness from 30 to 40 inches. Reaction is strongly acid or very strongly acid except where lime has been added.

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

The E horizon has hue of 10YR, value of 5, and chroma of 3 or 4. Texture is sandy loam or fine sandy loam.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. Texture is sandy clay loam or sandy loam. Silt content is less than 20 percent.

The BC horizon has colors similar to those of the Bt horizon. Texture is sandy loam or fine sandy loam.

The C and 2C horizons have hue of 7.5YR, value of 5 to 7, and chroma of 6 or 8; or hue of 10YR, value of 6 or 7, and chroma of 6 or 8. Texture is loamy sand or sand.

Muckalee Series

The Muckalee series consists of deep, poorly drained, moderately permeable soils on flood plains of streams. These soils are subject to frequent flooding of brief duration. Most areas of these soils are subject to scouring and uneven deposition of overwash. They formed in stratified loamy and sandy fluvial sediments. Slopes range from 0 to 2 percent.

Muckalee soils are associated on the landscape with Bibb, Bethera, Dorovan, Florala, Iuka, Osier, and Rains soils. Bibb soils are strongly acid or very strongly acid throughout. Bethera soils have an argillic horizon that has more than 35 percent clay. Dorovan soils have an organic layer 51 or more inches thick. Florala soils have an argillic horizon that has 10 to 18 percent clay. Iuka soils are moderately well drained and are at a slightly higher elevation than Muckalee soils. Osier soils have a sandy C horizon. Rains soils have an argillic horizon that has 18 to 35 percent clay.

Typical pedon of Muckalee sandy loam, in an area of Muckalee, Bibb, and Osier soils, 0 to 2 percent slopes, frequently flooded; 1,500 feet west and 900 feet south of the northeast corner of sec. 15, T. 4 N., R. 16 E.

A—0 to 10 inches; gray (10YR 5/1) sandy loam; common medium distinct pale brown (10YR 6/3) mottles; weak fine granular structure; friable; many fine and medium roots; very strongly acid; clear smooth boundary.

Cg1—10 to 18 inches; gray (10YR 6/1) sandy loam; common medium distinct dark yellowish brown (10YR 4/4) mottles; thin strata of sandy material; weak fine granular structure; very friable; common fine and medium roots; medium acid; gradual wavy boundary.

Cg2—18 to 42 inches; gray (10YR 6/1) sandy loam; common fine distinct dark brown (10YR 4/3) mottles; thin strata of sandy material; weak fine granular structure; very friable; few fine and medium roots; medium acid; gradual wavy boundary.

Cg3—42 to 54 inches; gray (10YR 6/1) sandy loam; many medium distinct yellowish brown (10YR 5/4) mottles; weak fine granular structure; very friable; slightly acid; gradual wavy boundary.

Cg4—54 to 60 inches; mottled gray (10YR 6/1), yellowish brown (10YR 5/6), and pale brown (10YR 6/3) sandy loam; weak fine granular structure; very friable; slightly acid.

Reaction is strongly acid or very strongly acid in the A horizon and medium acid to neutral in the C horizon. Bedding planes are evident in the 10- to 40-inch control section.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. If the value is 3, the A horizon is less

than 6 inches thick. Texture is sandy loam, loam, or loamy sand.

The Cg horizon has hue of 10YR or 5Y, value of 4 to 6, and chroma of 1. Strata of mottles of very dark gray, yellowish brown, brown, or dark brown are few to many. Texture is sandy loam, but in some pedons it is loamy sand that has thin strata of sandy clay loam or sand. Clay content of the 10- to 40-inch control section averages about 10 to 18 percent.

Orangeburg Series

The Orangeburg series consists of deep, well drained, moderately permeable soils on uplands of the Coastal Plain. These soils formed in medium textured to moderately fine textured, unconsolidated marine sediments. Slopes range from 0 to 20 percent.

Orangeburg soils are associated on the landscape with Cowarts, Dothan, Lucy, Red Bay, and Troup soils. Cowarts soils have a solum 20 to 40 inches thick. Dothan soils have a Bt horizon that has hue of 7.5YR or more yellow. Lucy soils have a sandy epipedon 20 to 40 inches thick. Red Bay soils are dark red throughout the Bt horizon. Troup soils have a sandy epipedon more than 40 inches thick.

Typical pedon of Orangeburg sandy loam, 1 to 5 percent slopes; 2,040 feet north and 1,020 feet west of the southeast corner of sec. 3, T. 4 N., R. 18 E.

Ap—0 to 8 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; strongly acid; abrupt smooth boundary.

Bt1—8 to 14 inches; red (2.5YR 4/6) sandy loam; weak fine granular structure; very friable; very strongly acid; gradual smooth boundary.

Bt2—14 to 48 inches; red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; thin patchy faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—48 to 60 inches; dark red (2.5YR 3/6) sandy clay loam; weak medium subangular blocky structure; friable; thin patchy distinct clay films on faces of peds; very strongly acid.

The solum ranges in thickness from 60 to more than 72 inches. Reaction is strongly acid or very strongly acid throughout except where lime has been added.

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

Some pedons have a BE horizon that has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8; or hue of 5YR, value of 4 or 5, and chroma of 6 to 8. Texture is sandy loam or fine sandy loam.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8. Texture is predominately sandy clay loam but can range to sandy loam. Below a depth of 40 inches, the color can range to dark red, and the texture can range to sandy clay. The lower part of the Bt horizon can have few or common mottles in shades of brown. The upper 20 inches of the Bt horizon is 25 to 35 percent clay and is less than 15 percent silt.

Osier Series

The Osier series consists of deep, poorly drained, rapidly permeable soils on flood plains of streams. These soils are subject to frequent flooding of brief duration. Most areas of these soils are subject to scouring and uneven deposition of overwash. The Osier soils formed in stratified loamy and sandy fluvial sediments. Slopes range from 0 to 2 percent.

Osier soils are associated on the landscape with Bibb, Bethera, Dorovan, Florala, luka, Muckalee, and Rains soils. Bibb soils have less than 18 percent clay but more than 5 to 15 percent silt and clay in the control section. Bethera soils have an argillic horizon that has more than 35 percent clay. Dorovan soils have an organic layer 51 or more inches thick. Florala soils have an argillic horizon that has 10 to 18 percent clay. luka soils are moderately well drained, have more than 15 percent silt and clay, and are at a slightly higher elevation than Osier soils. Muckalee soils have more than 15 percent silt and clay and are medium acid to neutral in the control section. Rains soils have an argillic horizon that has 18 to 35 percent clay.

Typical pedon of Osier sand, in an area of Muckalee, Bibb, and Osier soils, 0 to 2 percent slopes, frequently flooded; 2,560 feet north and 2,560 feet west of the southeast corner of sec. 15, T. 1 N., R. 14 E.

A1—0 to 14 inches; stratified very pale brown (10YR 7/3) sand and brownish yellow (10YR 6/6) sandy loam; massive; very friable; layers 0.25 to 1 inch thick; few fine roots; very strongly acid; clear smooth boundary.

A2—14 to 19 inches; black (10YR 2/1) sandy loam; weak fine granular structure; friable; many fine and medium roots; extremely acid; clear smooth boundary.

Cg—19 to 30 inches; light gray (10YR 6/1) sand; few fine faint grayish brown mottles; single grained; very friable; very strongly acid; gradual wavy boundary.

C1—30 to 42 inches; very dark grayish brown (10YR 3/2) sand; common thin strata of grayish brown (10YR 5/2) sandy material; massive; friable; very strongly acid; gradual wavy boundary.

C2—42 to 54 inches; very dark grayish brown (10YR 3/2) sand; many thin strata of grayish brown (10YR 5/2) sandy material; massive; very friable; extremely acid; gradual wavy boundary.

Cg'—54 to 60 inches; light gray (10YR 7/2) sand; single grained; very friable; very strongly acid.

Reaction is extremely acid or very strongly acid throughout. Bedding planes are evident in the upper 40 inches.

The A1 horizon has hue of 10YR and 7.5YR, value of 5 to 7, and chroma of 3 or 4. Texture is sand, loamy sand, sandy loam, or loam. Some pedons do not have an A1 horizon.

The A2 horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. If the value is 3 or less, the A horizon is less than 6 inches thick. Texture is sand, loamy sand, or sandy loam.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2; or hue of 10YR, value of 3, and chroma of 2. In most pedons, this horizon has few or common mottles in shades of brown or yellow. Texture of the upper part of the C horizon and the Cg horizon is sand, loamy fine sand, or loamy sand. The lower part of the C horizon and the Cg' horizon is sand. The content of silt and clay in the 10- to 40-inch control section is 5 to 15 percent.

Rains Series

The Rains series consists of deep, poorly drained, moderately permeable soils on uplands and stream terraces of the Coastal Plain. These soils formed in medium textured, unconsolidated sediments of the Coastal Plain. They are on nearly level flats, in slight depressions, and on low stream terraces. Slopes range from 0 to 2 percent.

Rains soils are associated on the landscape with Dothan, Florala, Grady, and Lynchburg soils. Dothan soils are higher on the landscape than Rains soils and do not have gray mottles within 30 inches of the surface. Florala and Lynchburg soils are slightly higher on the landscape and have higher chroma in the upper 30 inches. Florala soils also have less than 18 percent clay in the control section. Grady soils are in positions similar to those of the Rains soils and have more than 35 percent clay in the control section.

Typical pedon of Rains sandy loam, 0 to 2 percent slopes; 800 feet north and 200 feet east of the southwest corner of sec. 25, T. 1 N., R. 18 E.

A—0 to 5 inches; black (10YR 2/1) sandy loam; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.

E—5 to 14 inches; light brownish gray (10YR 6/2) sandy loam; common medium distinct dark gray (10YR 4/1) mottles; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

BEg—14 to 20 inches; light brownish gray (10YR 6/2) sandy loam; few fine distinct light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable; few fine and medium roots; sand grains coated and bridged with clay; few brown concretions; very strongly acid; gradual wavy boundary.

Btg1—20 to 45 inches; light gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine and medium roots; thin patchy faint clay films on faces of peds; few gray sandy loam pockets or strata; very strongly acid; gradual wavy boundary.

Btg2—45 to 65 inches; light gray (10YR 6/1) sandy clay loam; many medium distinct yellowish brown (10YR 5/6) mottles; weak to moderate medium subangular blocky structure; friable; thin patchy faint clay films on faces of peds; very strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2.

The E horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. Mottles that have higher chroma are in some pedons. Texture is sandy loam or fine sandy loam.

The BEg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is sandy loam or fine sandy loam.

The Btg horizon has colors similar to those of the BEg horizon and generally has few to many mottles that have higher chroma. Texture is sandy clay loam or clay loam that has 18 to 35 percent clay in the upper 20 inches. In the lower part of the Btg horizon, texture ranges to sandy clay.

Red Bay Series

The Red Bay series consists of deep, well drained, moderately permeable soils on uplands of the Coastal Plain. These soils formed in medium textured to moderately fine textured, unconsolidated marine sediments. Slopes range from 0 to 5 percent.

Red Bay soils are associated on the landscape with Dothan, Lucy, Orangeburg, and Troup soils. Dothan soils are at a higher elevation than Red Bay soils and have a Bt horizon in hue of 7.5YR or more yellow. Lucy soils are at a lower elevation and have a sandy epipedon 20 to 40 inches thick. Orangeburg soils are at the same elevation as Red Bay soils but have a moist value of 4 or more in the upper part of the Bt horizon. Troup soils are in a lower position on the landscape and have a sandy epipedon more than 40 inches thick.

Typical pedon of Red Bay sandy loam, 1 to 5 percent slopes; 1,715 feet north and 2,090 feet east of the southwest corner of sec. 9, T. 5 N., R. 15 E.

Ap—0 to 11 inches; dark brown (7.5YR 3/2) sandy loam; weak fine granular structure; very friable; many fine

and medium roots; strongly acid; abrupt smooth boundary.
Bt1—11 to 40 inches; dark red (2.5YR 3/6) sandy clay loam; weak medium subangular blocky structure; friable; common fine roots; thin patchy faint clay films on faces of peds; strongly acid; gradual wavy boundary.
Bt2—40 to 72 inches; dark red (2.5YR 3/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; thin patchy faint clay films on faces of peds; very strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid except where lime has been added.

The A horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 3, and chroma of 2; or hue of 5YR or 2.5YR, value of 3, and chroma of 3 or 4. Texture is sandy loam or fine sandy loam.

Some pedons have a BE horizon that has hue of 2.5YR or 10R, value of 3, and chroma of 4 or 6. Texture is sandy loam or sandy clay loam.

The Bt horizon has hue of 2.5YR or 10R, value of 3, and chroma of 6. Texture is sandy loam or sandy clay loam. In the upper 20 inches of this horizon, clay content ranges from 25 to 32 percent and silt content is less than 20 percent.

Smithdale Series

The Smithdale series consists of deep, well drained, moderately permeable soils on uplands of the Coastal Plain. These soils formed in medium to moderately fine textured, unconsolidated marine sediments. Slopes range from 15 to 35 percent.

Smithdale soils are associated on the landscape with Blanton, Cowarts, Luverne, Orangeburg, and Troup soils. Blanton and Troup soils have a sandy epipedon more than 40 inches thick. Cowarts soils have a yellowish brown argillic horizon. Luverne soils have a clayey argillic horizon. Orangeburg soils have less than 20 percent silt in the control section and do not have a clay decrease within a depth of 60 inches.

Typical pedon of Smithdale sandy loam, 15 to 35 percent slopes; 1,450 feet west and 2,550 feet north of the southeast corner of sec. 34, T. 5 N., R. 14 E.

A—0 to 6 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.
E—6 to 11 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.
Bt1—11 to 31 inches; yellowish red (5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; thin patchy clay films on faces of peds; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.
Bt2—31 to 46 inches; yellowish red (5YR 4/6) sandy clay loam; few medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; thin patchy clay films on faces of peds; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.
Bt3—46 to 54 inches; yellowish red (5YR 4/6) sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few mica flakes; strongly acid; gradual wavy boundary.
BC—54 to 60 inches; strong brown (7.5YR 5/6) sandy loam; many medium distinct yellowish red (5YR 5/8), yellowish brown (10YR 5/6), and very pale brown (10YR 7/3) mottles; weak medium subangular blocky structure; some sand grains coated and bridged with clay; common uncoated sand grains; few mica flakes; weakly stratified; strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 4, and chroma of 1 to 3. If the A horizon is less than 5 inches thick, value is 3 and chroma is 1 or 2. Texture is sandy loam or loamy sand.

The E horizon has hue of 10YR, value of 5, and chroma of 2 to 4. Texture is sandy loam or loamy sand.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. Texture is sandy loam or sandy clay loam. Clay content ranges from 18 to 33 percent in the upper 20 inches of this horizon.

The BC horizon has hue of 10YR to 2.5YR, value of 4 or 5, and chroma of 4 to 8. It can have few or common brown, yellow, or red mottles. Texture is sandy loam or fine sandy loam.

Troup Series

The Troup series consists of deep, well drained, moderately permeable soils on uplands of the Coastal Plain. These soils formed in thick, unconsolidated beds of loamy sand and sandy clay loam marine sediments. Slopes range from 0 to 35 percent.

Troup soils are associated on the landscape with Blanton, Bonifay, Cowarts, Dothan, Fuquay, Lucy, Luverne, Orangeburg, and Red Bay soils. Blanton and Bonifay soils are at a lower elevation than Troup soils. Blanton soils have a Bt horizon that has hue of 10YR or more yellow, and Bonifay soils have more than 5 percent plinthite. Cowarts soils are at a higher elevation and have a solum 20 to 40 inches thick that has a fine-loamy control section. Dothan, Orangeburg, and Red Bay soils are at a higher elevation and have an A horizon less

than 20 inches thick. Fuquay and Lucy soils are in the same position on the landscape as Troup soils and have a loamy sand epipedon 20 to 40 inches thick. Luverne soils have a clayey argillic horizon and a solum 30 to 50 inches thick.

Typical pedon of Troup loamy sand, 0 to 5 percent slopes; 300 feet south and 40 feet west of the northeast corner of sec. 33, T. 2 N., R. 15 E.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) loamy sand; single grained; loose; many fine roots; few small iron concretions; strongly acid; clear smooth boundary.

E1—7 to 16 inches; brown (10YR 5/3) loamy sand; single grained; loose; common fine roots; few small quartz and chert gravel; common uncoated sand grains; strongly acid; gradual wavy boundary.

E2—16 to 38 inches; yellowish brown (10YR 5/6) loamy sand; single grained; loose; common fine roots; few small quartz and chert gravel; common uncoated sand grains; very strongly acid; gradual wavy boundary.

E3—38 to 47 inches; yellowish red (5YR 5/6) loamy sand; single grained; loose; few fine roots; few small quartz and chert gravel; common uncoated sand grains; very strongly acid; gradual wavy boundary.

Bt1—47 to 52 inches; red (2.5YR 5/6) sandy loam; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay; few fine roots; few small quartz and chert gravel; very strongly acid; gradual wavy boundary.

Bt2—52 to 80 inches; red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; few small quartz and chert gravel; sand grains coated and bridged with clay; thin patchy faint clay films on faces of peds; very strongly acid.

The solum is more than 80 inches thick. Reaction is strongly acid or very strongly acid except where lime has been added.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Texture is loamy sand or loamy fine sand.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 8; or hue of 5YR or 7.5YR, value of 5, and chroma of 6 to 8. Texture is loamy sand, sand, or fine sand.

Some pedons have a BE horizon that has hue of 7.5YR, value of 5, and chroma of 6 to 8; or hue of 5YR, value of 5, and chroma of 6 to 8. Texture is sandy loam or fine sandy loam.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8. Texture is sandy loam, fine sandy loam, or sandy clay loam.

Formation of the Soils

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.

The A, E, B, and C horizons are the four main horizons in most soils.

The A horizon is the surface layer. This horizon has the maximum accumulation of organic matter. The E horizon, or the subsurface layer, has the maximum loss of soluble or suspended material. Fuquay soils have an A horizon and an E horizon. Other soils, such as Red Bay soils, have an A horizon but do not have an E horizon. Organic matter has accumulated in the surface layer of all soils in Covington County to form an A horizon. The organic matter content varies because of differences in relief, wetness, and inherent fertility.

The B horizon, or the subsoil, lies immediately below the A or E horizon. This horizon has the maximum accumulation of dissolved or suspended material, such as iron or clay. The B horizon has not developed in very young soils, such as Bibb soils.

The C horizon, or the substratum, has been affected very little by soil-forming processes but can be somewhat modified by weathering.

Gleying is the chemical reduction and transfer of iron. It is evident in the wet soils of the county. Gleying, indicated by gray color in the subsoil and by gray mottles in other horizons, is evidence of the reduction and loss of iron. Some horizons, such as in the Florala soils, have reddish brown mottles and concretions, indicating a segregation of iron.

Carbonates and bases have been leached in most soils of the county. This action contributes to the development of the horizons and to the inherent low fertility and acid reaction of these soils.

In uniform material, natural drainage generally is closely associated with slope or relief, and it generally affects the color of the soil. Soils that formed under good drainage conditions, such as Orangeburg soils, have a uniformly bright color subsoil. Soils that formed under poor drainage conditions, such as Grady and Rains soils, have grayish colors. Soils that formed under moderate drainage conditions, such as Chrysler and Eunola soils, have a subsoil that is mottled gray and brown. The grayish color persists even after artificial drainage is provided.

Surface soil erodes in steep areas. In low-lying areas or depressions, soil material often accumulates and adds to the thickness of the surface layer. In some areas, the formation and removal of soil material are in equilibrium with soil development.

The presence or absence of relief is also related to the eluviation of clay from the E horizon and to the Bt horizon.

Factors of Soil Formation

Soil is a natural, three-dimensional body on the earth's surface that supports plants. It has properties resulting from the interaction of parent material, climate, relief, and flora and fauna over a period of time. These factors determine the nature of the soil that forms at any point on the earth. The relative importance of each factor differs from place to place. When a factor varies, a different soil forms.

Climate and living organisms are the active factors of soil formation. They act on parent material and change it to a natural body that has definite characteristics. Relief conditions the effects of climate and living organisms. It affects 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 to change the parent material into soil. The development of a distinct soil horizon normally requires a long period of time.

Parent Material

The soils of Covington County formed mainly in three kinds of parent material; marine sediment that has undergone considerable weathering in place, water-deposited material on stream terraces and flood plains, and organic material that has accumulated in the bays.

Cowarts, Dothan, Malbis, and Orangeburg soils formed in weathered marine sediment. Eunola, Iuka, Kalmia, and Muckalee soils formed in water-deposited material on stream terraces and flood plains. Dorovan soils formed in thick beds of highly decomposed organic matter.

Climate

The climate of Covington 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 58.5 inches a year. This mild, humid climate favors rapid decomposition of organic matter and hastens chemical reaction 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

Topography influences soil formation by its effect on drainage, runoff, and erosion. In Covington County, the topography ranges from nearly level to strongly sloping. The elevation ranges from 100 to 450 feet above sea level. Large flat areas and depressions generally are poorly drained, and accumulated water, received mainly as runoff from adjacent areas, retards soil formation. As slope increases, the hazard of erosion becomes greater and runoff increases, but less water soaks into the soil and leaching decreases. In places, erosion nearly keeps pace with soil formation; therefore, steep soils are generally shallow and weakly developed.

The direction of slope affects the microclimate. Soils that have slopes facing the south or southwest warm up somewhat earlier in spring and generally reach a higher temperature each day than those slopes facing north. As a result, soils that have south- or southwest-facing slopes have accelerated chemical weathering. Soils that have north-facing slopes retain moisture longer because they are shaded for longer periods and have a lower temperature. In Covington County, differences caused by the direction of slope are slight and of minor importance in soil formation.

Flora and Fauna

Plant and animal organisms greatly influence the formation and the character of the soil. The other factors of soil formation determine trees, grasses, earthworms, rodents, fungi, bacteria, and other forms of plant and animal life. Animal activity is mostly confined to the surface layer. The soil is continually mixed by their activity, which helps water infiltration. Plant roots create channels through which air and water move more rapidly, thus improving the soil structure and increasing the rate of chemical reaction.

Micro-organisms help decompose organic matter, which releases plant nutrients and chemicals into the soil. These plant nutrients and other chemicals are then used in the chemical reactions or weathering of the soil and are either used by the plants or leached from the soil. Human activities that influence the plant and animal population are important to future soil formation.

The native vegetation of the upland soils in Covington County consisted of coniferous and deciduous trees as dominant overstory. The understory plants were gallberry, southern bayberry, holly, panicum, bluestem, American beautyberry, indiangrass, longleaf uniola, and dogwood. These plants represent only a very limited variety that once grew in this county and can be used as a guide to plants presently in the county.

The species distribution of fauna also reflect these plant communities. The animals have an impact on the soil properties of a particular area, such as the aeration that worms, moles, armadillo, and gophers provide to a compacted soil. Also, microbes of a particular plant community react to various soil conditions and consequently influence the soil profile by providing decayed plant and animal 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 factors have been active for a relatively short time.

Geologically, the soils in Covington County are fairly young. The youngest soils are the alluvial soils along the streams. These soils receive deposits of sediment and are subject to a cumulative soil-forming process. In most cases, these soils have very weakly defined horizons, mainly because the soil-forming processes have only been active for a short time.

The more mature soils in the county are on terraces of the Conecuh and Yellow Rivers. They formed in material deposited by the rivers, but the river channels are now deeper and their overflow no longer reaches these soils. Many of these soils have fairly strong horizon development.

The oldest soils in the county, on uplands, formed in marine sediment that has undergone considerable weathering.

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Glossary

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

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

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.

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.

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

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

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

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

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

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

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

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

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

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.

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

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

Chiseling. Tillage with an implement having one or more soil-penetrating points that 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 film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels, i.e., clay coating, clay skin.

Climax vegetation. 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 fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in

diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

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

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

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

Compressible (in tables). The volume of soft soil decreases excessively under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

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. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

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

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

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

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

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

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

Cemented.—Hard; little affected by moistening.

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

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

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

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.

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

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

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

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

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

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

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

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

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

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods

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

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

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

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

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

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

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

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

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

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The movement of water into the soil is rapid.

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

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

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

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

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

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant that is not a grass or a sedge.

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

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

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 up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 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 (geology). Water filling all the unblocked pores of underlying 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.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow

represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

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

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

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

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

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

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

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

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.

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

Infiltration. The downward entry of water into the immediate surface of soil or other material. This contrasts 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

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

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.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

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.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments that are 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

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

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

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

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

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

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

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

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

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

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

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

Narrow-base terrace. A terrace no more than 4 to 8 feet wide at the base. A narrow-base terrace is similar to a broad-base terrace, except for the width of the ridge and channel.

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

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

Open space. A relatively undeveloped green or wooded area provided mainly within an urban area to minimize feelings of congested living.

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

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

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

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture.

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

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

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

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

Piping (in tables). Subsurface tunnels or pipelike cavities are formed 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.

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.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). In these areas, surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of the acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

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 is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Rippable bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth —(in tables). There is a shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil 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 or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

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. 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.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to 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 (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally it is indicative of an old weathered surface. In a cross section, thickness of the line can be one fragment or more. It generally overlies material that weathered in place, and it is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

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 and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

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

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content 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."

Terrace. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

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 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.

Trace elements. Chemical elements, such as zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). There is a risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variegation. Refers to patterns of contrasting colors that are assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. 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. This 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 sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Data recorded in the period 1951-78 at Andalusia, Alabama]

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	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----	59.3	34.9	47.1	78	13	127	4.61	2.70	6.31	7	0.0
February---	63.1	36.9	50.0	82	17	147	4.98	3.12	6.64	7	0.1
March------	70.3	43.7	57.0	86	24	252	5.94	3.06	8.46	8	0.0
April------	79.6	51.4	65.5	92	33	465	5.05	1.75	7.78	5	0.0
May--------	85.9	58.8	72.4	97	41	694	4.70	1.71	7.19	6	0.0
June-------	91.0	65.3	78.2	100	52	846	4.95	2.27	7.25	8	0.0
July-------	92.3	68.1	80.2	100	60	936	6.31	3.63	8.68	11	0.0
August-----	91.9	67.9	79.9	99	58	927	5.27	2.58	7.60	9	0.0
September--	87.7	63.8	75.8	98	47	774	4.69	1.78	7.12	6	0.0
October----	78.7	51.2	65.0	92	31	465	2.65	0.50	4.33	4	0.0
November---	69.0	41.5	55.1	85	22	190	3.58	2.10	4.90	6	0.0
December---	61.7	36.3	49.2	80	17	120	5.81	2.96	8.30	8	0.0
Yearly:											
Average--	77.5	51.7	64.6	---	---	---	---	---	---	---	---
Extreme--	---	---	---	102	12	---	---	---	---	---	---
Total----	---	---	---	---	---	5,943	58.54	47.28	70.01	85	0.1

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 °F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data recorded in the period 1951-78 at Andalusia, 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--	March 20	March 27	April 10
2 years in 10 later than--	March 7	March 18	April 3
5 years in 10 later than--	February 10	March 2	March 21
First freezing temperature in fall:			
1 year in 10 earlier than--	November 12	November 2	October 24
2 years in 10 earlier than--	November 19	November 8	October 29
5 years in 10 earlier than--	December 3	November 19	November 9

TABLE 3.--GROWING SEASON

[Data recorded in the period 1951-78 at Andalusia, 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	249	225	202
8 years in 10	265	238	213
5 years in 10	295	262	232
2 years in 10	326	286	252
1 year in 10	342	299	263

TABLE 4.--SUITABILITY AND LIMITATIONS OF GENERAL SOIL MAP UNITS FOR MAJOR LAND USES

Map unit	Extent of area	Cultivated crops	Woodland	Urban uses	Intensive recreation areas	Extensive recreation areas	Wildlife habitat		
							Open-land	Wood-land	Wet-land
	Pct								
1. Muckalee-Bibb-Dorovan	9	Unsuited: flooding, wetness.	Fair: flooding, wetness.	Unsuited: flooding, wetness.	Poor: flooding, wetness.	Poor: flooding, wetness.	Poor	Fair	Well.
2. Eunola-Lynchburg-Bigbee	4	Well	Well	Poor: flooding.	Fair: flooding, wetness.	Well	Well	Well	Poor.
3. Florala-Fuquay	4	Fair: wetness, droughty.	Well	Fair: wetness, percs slowly.	Fair: wetness.	Well	Well	Well	Fair.
4. Blanton-Lynchburg	5	Fair: droughty, wetness.	Well	Fair: seepage, too sandy, wetness.	Fair: wetness.	Well	Fair	Well	Fair.
5. Orangeburg-Troup	16	Well	Well	Well: slope, seepage.	Well	Well	Well	Well	Very poor.
6. Orangeburg-Cowarts	20	Well to fair: slope.	Well	Well: slope, percs slowly.	Well	Well	Well	Well	Very poor.
7. Dothan-Bonifay-Fuquay	36	Well: droughty.	Well	Well: percs slowly, wetness.	Well	Well	Well	Well	Very poor.
8. Smithdale-Troup-Fuquay	3	Unsuited to poor: slope, droughty.	Well	Poor: slope, seepage, percs slowly.	Fair to poor: slope.	Well	Poor	Well	Very poor.
9. Arundel-Troup-Luverne	3	Unsuited to poor: slope, droughty.	Well	Poor: slope, seepage, percs slowly.	Poor: slope.	Well	Poor	Well	Very poor.

TABLE 5.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
ArE	Arundel loamy fine sand, 8 to 25 percent slopes	12,650	1.9
BgA	Bigbee loamy sand, 0 to 5 percent slopes, rarely flooded	5,242	0.8
BnB	Blanton loamy fine sand, 0 to 5 percent slopes	14,028	2.1
BnC	Blanton loamy fine sand, 5 to 12 percent slopes	14,458	2.2
BoB	Bonifay loamy fine sand, 0 to 5 percent slopes	21,888	3.3
BoC	Bonifay loamy fine sand, 5 to 10 percent slopes	32,097	4.8
CaA	Chrysler sandy loam, 0 to 2 percent slopes, rarely flooded	1,747	0.3
CdB	Cowarts-Dothan complex, 2 to 5 percent slopes	21,377	3.2
CdC	Cowarts-Dothan complex, 5 to 10 percent slopes	48,251	7.3
CuC	Cowarts-Urban land complex, 2 to 8 percent slopes	3,175	0.5
DaA	Dorovan muck, 0 to 1 percent slopes	8,300	1.2
DmA	Dothan and Malbis sandy loams, 0 to 1 percent slopes	2,574	0.4
DmB	Dothan and Malbis sandy loams, 1 to 5 percent slopes	70,992	10.7
DuC	Dothan-Urban land complex, 0 to 8 percent slopes	1,117	0.2
EsC	Esto sandy loam, 2 to 8 percent slopes	2,792	0.4
EuA	Eunola loamy fine sand, 0 to 2 percent slopes, rarely flooded	9,786	1.5
FoA	Florala sandy loam, 0 to 3 percent slopes	32,956	5.0
FuB	Fuquay loamy fine sand, 0 to 5 percent slopes	36,873	5.6
GrA	Grady sandy loam, 0 to 2 percent slopes, ponded	2,179	0.3
IbA	Iuka-Bibb sandy loams, 0 to 2 percent slopes, frequently flooded	6,479	1.0
KaA	Kalmia loamy fine sand, 0 to 2 percent slopes, rarely flooded	2,211	0.3
LuB	Lucy loamy sand, 0 to 5 percent slopes	10,144	1.5
LyA	Lynchburg sandy loam, 0 to 2 percent slopes	10,631	1.6
MaA	Maxton sandy loam, 0 to 2 percent slopes, rarely flooded	1,892	0.3
MBA	Muckalee, Bibb, and Osier soils, 0 to 2 percent slopes, frequently flooded	51,125	7.7
OrA	Orangeburg sandy loam, 0 to 1 percent slopes	1,180	0.2
OrB	Orangeburg sandy loam, 1 to 5 percent slopes	48,200	7.3
OrC	Orangeburg sandy loam, 5 to 8 percent slopes	50,720	7.6
OrE	Orangeburg sandy loam, 8 to 20 percent slopes	38,450	5.8
OuC	Orangeburg-Urban land complex, 0 to 8 percent slopes	1,876	0.3
PIT	Pits, nearly level	192	*
RaA	Rains sandy loam, 0 to 2 percent slopes	8,159	1.2
RbA	Rains-Bethera complex, 0 to 2 percent slopes, frequently flooded	8,293	1.2
RdB	Red Bay sandy loam, 1 to 5 percent slopes	4,614	0.7
SmE	Smithdale sandy loam, 15 to 35 percent slopes	9,602	1.4
TrB	Troup loamy sand, 0 to 5 percent slopes	16,912	2.5
TrD	Troup loamy sand, 5 to 15 percent slopes	38,417	5.8
TUE	Troup-Luverne association, 15 to 45 percent slopes	8,836	1.3
	Water	3,900	0.6
	Total	664,315	100.0

* Less than 0.1 percent.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability	Corn	Soybeans	Peanuts	Grain sorghum	Improved bermuda-grass	Bahiagrass	Cool-season annuals
		Bu	Bu	Lbs	Bu	Tons	AUM*	AUM*
ArE---------- Arundel	VIIe	---	---	---	---	---	---	---
BgA---------- Bigbee	IIIs	50	25	1,700	60	4.5	7.0	4.0
BnB---------- Blanton	IIIs	50	25	1,800	60	4.5	7.0	4.0
BnC---------- Blanton	IVs	---	---	---	---	4.5	6.5	3.7
BoB---------- Bonifay	IIIs	50	25	1,800	60	4.5	7.0	4.0
BoC---------- Bonifay	IVs	---	---	---	---	4.0	6.5	3.7
CaA---------- Chrysler	IIw	100	45	---	9.5	6.0	10.0	5.0
CdB---------- Cowarts-Dothan	IIe	90	35	3,000	95	6.0	9.0	5.0
CdC---------- Cowarts-Dothan	IIIe	80	28	2,700	85	5.5	8.5	4.5
CuC: Cowarts-Urban land.								
DaA---------- Dorovan	VIIw	---	---	---	---	---	---	---
DmA---------- Dothan and Malbis	I	110	45	4,000	110	7.0	10.0	5.0
DmB---------- Dothan and Malbis	IIe	100	40	3,800	100	7.0	10.0	5.0
DuC: Dothan-Urban land.								
EsC---------- Esto	IVe	---	20	---	60	4.0	5.8	3.7
EuA---------- Eunola	IIw	90	45	---	100	5.5	10.0	4.0
FoA---------- Florala	IIw	90	45	---	100	5.5	10.0	4.0
FuB---------- Fuquay	IIs	80	30	2,900	85	5.5	8.5	5.0

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Peanuts	Grain sorghum	Improved bermuda-grass	Bahiagrass	Cool-season annuals
		Bu	Bu	Lbs	Bu	Tons	AUM*	AUM*
GrA--Grady	Vw	---	---	---	---	---	---	---
IbA--Iuka-Bibb	Vw	---	---	---	---	---	---	---
KaA--Kalmia	I	95	45	4,000	100	7.0	10.0	5.0
LuB--Lucy	IIs	80	33	2,800	85	5.5	8.5	5.0
LyA--Lynchburg	IIw	90	45	---	100	5.5	10.0	4.0
MaA--Maxton	I	95	45	4,000	100	7.0	10.0	5.0
MBA--Muckalee, Bibb, and Osier	Vw	---	---	---	---	---	---	---
OrA--Orangeburg	I	100	45	4,000	110	7.0	10.0	5.0
OrB--Orangeburg	IIe	95	40	3,800	100	7.0	10.0	5.0
OrC--Orangeburg	IIIe	80	30	3,200	90	6.0	8.0	4.5
OrE--Orangeburg	VIe	---	---	---	---	4.5	7.0	---
OuC: Orangeburg-Urban land.								
PIT: Pits.								
RaA--Rains	IIIw	90	40	---	100	---	10.0	---
RbA--Rains-Bethera	VIw	---	---	---	---	---	---	---
RdB--Red Bay	IIe	95	40	3,800	100	7.0	10.0	5.0
SmE--Smithdale	VIIe	---	---	---	---	---	---	---
TrB--Troup	IIIs	50	25	1,800	60	4.5	7.0	4.0
TrD--Troup	VIs	---	---	---	---	4.0	6.5	3.7

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Peanuts	Grain sorghum	Improved bermuda-grass	Bahiagrass	Cool-season annuals
		Bu	Bu	Lbs	Bu	Tons	AUM*	AUM*
TUE:								
Troup----------	VIIs	---	---	---	---	---	---	---
Luverne--------	VIIe	---	---	---	---	---	---	---

* 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.

TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	7,857	---	---	---
II	247,320	145,183	55,120	47,017
III	165,200	98,971	8,159	58,070
IV	49,347	2,792	---	46,555
V	59,783	---	59,783	---
VI	85,160	38,450	8,293	38,417
VII	39,388	25,875	8,300	5,213

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]

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity*	
								cu.ft/a	
ArE---------- Arundel	8R	Moderate	Moderate	Moderate	Moderate	Loblolly pine-------	85	120	Loblolly pine.
						Shortleaf pine------	75	--	
						Sweetgum-----------	--	--	
BqA---------- Bigbee	8S	Slight	Slight	Moderate	Slight	Loblolly pine-------	80	110	Loblolly pine,
						Longleaf pine-------	75	--	longleaf pine.
						Water oak----------	--	--	
						Post oak-----------	--	--	
BnB, BnC-------- Blanton	8S	Slight	Moderate	Moderate	Moderate	Loblolly pine-------	80	110	Loblolly pine,
						Slash pine----------	80	--	slash pine,
						Longleaf pine-------	70	--	longleaf pine.
						Southern red oak----	--	--	
BoB, BoC-------- Bonifay	8S	Slight	Moderate	Moderate	Moderate	Loblolly pine-------	80	110	Loblolly pine,
						Slash pine----------	80	--	slash pine,
						Longleaf pine-------	70	--	longleaf pine.
CaA---------- Chrysler	11W	Slight	Moderate	Slight	Severe	Loblolly pine-------	100	154	Loblolly pine,
						Shortleaf pine------	90	--	slash pine,
						Slash pine----------	100	--	sweetgum,
						Sweetgum-----------	90	--	water oak.
						Water oak----------	100	--	
						Yellow poplar-------	110	--	
						American sycamore---	110	--	
CdB, CdC:									
Cowarts--------	9A	Slight	Slight	Slight	Moderate	Loblolly pine-------	90	131	Loblolly pine,
						Slash pine----------	90	--	slash pine,
						Longleaf pine-------	85	--	longleaf pine.
Dothan---------	9A	Slight	Slight	Slight	Moderate	Loblolly pine-------	90	131	Loblolly pine,
						Slash pine----------	90	--	slash pine,
						Longleaf pine-------	85	--	longleaf pine.
DaA---------- Dorovan	6W	Slight	Severe	Severe	Severe	Baldcypress---------	60	87	Baldcypress.
						Blackgum-----------	70	--	
						Water tupelo--------	60	--	
						Sweetbay-----------	--	--	
DmA, DmB:									
Dothan---------	9A	Slight	Slight	Slight	Moderate	Loblolly pine-------	90	131	Loblolly pine,
						Slash pine----------	90	--	slash pine,
						Longleaf pine-------	85	--	longleaf pine.
Malbis---------	9A	Slight	Slight	Slight	Moderate	Loblolly pine-------	90	131	Loblolly pine,
						Slash pine----------	90	--	slash pine.
						Longleaf pine-------	80	--	
EsC---------- Esto	8A	Slight	Slight	Slight	Moderate	Loblolly pine-------	80	110	Loblolly pine,
						Longleaf pine-------	70	--	slash pine,
						Slash pine----------	80	--	longleaf pine.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity*	
								cu.ft/a	
EuA---------- Eunola	9W	Slight	Moderate	Slight	Moderate	Loblolly pine-------	90	131	Loblolly pine,
						Slash pine----------	90	--	slash pine,
						Sweetgum----------	90	--	sweetgum,
						American sycamore---	--	--	yellow poplar.
FoA---------- Florala	9W	Slight	Moderate	Slight	Moderate	Loblolly pine-------	90	131	Loblolly pine,
						Longleaf pine-------	80	--	slash pine,
						Slash pine----------	90	--	sweetgum,
						Sweetgum----------	90	--	American
						Water oak----------	90	--	sycamore.
						American sycamore---	90	--	
FuB---------- Fuquay	8S	Slight	Moderate	Moderate	Moderate	Loblolly pine-------	85	120	Loblolly pine,
						Slash pine----------	85	--	slash pine,
						Longleaf pine-------	75	--	longleaf pine.
GrA---------- Grady	6W	Slight	Severe	Severe	Severe	Baldcypress---------	60	87	Baldcypress.
						Water tupelo--------	70	--	
						Sweetbay----------	--	--	
						Blackgum----------	--	--	
IbA:									
Iuka----------	11W	Slight	Moderate	Moderate	Severe	Loblolly pine-------	100	154	Loblolly pine,
						Sweetgum----------	100	--	water oak,
						Eastern cottonwood--	105	--	sweetgum,
						Water oak----------	100	--	American
						American sycamore---	--	--	sycamore.
Bibb----------	9W	Slight	Severe	Severe	Severe	Loblolly pine-------	90	131	Loblolly pine,
						Sweetgum----------	90	--	sweetgum,
						Water oak----------	90	--	water oak.
KaA---------- Kalmia	9A	Slight	Slight	Slight	Moderate	Loblolly pine-------	90	131	Loblolly pine,
						Slash pine----------	90	--	slash pine,
						Sweetgum----------	90	--	sweetgum,
						Yellow poplar-------	--	--	water oak.
						Water oak----------	90	--	
LuB---------- Lucy	8S	Slight	Moderate	Moderate	Moderate	Loblolly pine-------	85	120	Loblolly pine,
						Slash pine----------	85	--	slash pine,
						Longleaf pine-------	75	--	longleaf pine.
LyA---------- Lynchburg	8W	Slight	Moderate	Slight	Severe	Loblolly pine-------	85	120	Loblolly pine,
						Slash pine----------	85	--	slash pine,
						Longleaf pine-------	75	--	sweetgum,
						Sweetgum----------	85	--	water oak.
						Water oak----------	85	--	
MaA---------- Maxton	9A	Slight	Slight	Slight	Moderate	Loblolly pine-------	90	131	Loblolly pine,
						Sweetgum----------	90	--	sweetgum,
						Slash pine----------	90	--	water oak.
						Water oak----------	90	--	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity*	
								cu.ft/a	
MBA:									
Muckalee	9W	Slight	Severe	Severe	Severe	Loblolly pine	90	131	Loblolly pine,
						Sweetgum	90	--	sweetgum,
						Slash pine	90	--	slash pine,
						Water oak	90	--	water oak.
Bibb	9W	Slight	Severe	Severe	Severe	Loblolly pine	90	131	Loblolly pine,
						Sweetgum	90	--	sweetgum,
						Water oak	90	--	water oak,
						Slash pine	90	--	slash pine.
Osier	8W	Slight	Severe	Severe	Severe	Loblolly pine	80	110	Loblolly pine,
						Slash pine	90	--	slash pine,
						Water oak	80	--	sweetgum,
						Sweetgum	80	--	water oak.
OrA, OrB, OrC---Orangeburg	9A	Slight	Slight	Slight	Moderate	Loblolly pine	90	131	Loblolly pine,
						Slash pine	90	--	slash pine,
						Longleaf pine	75	--	longleaf pine.
OrE---Orangeburg	9R	Moderate	Moderate	Slight	Moderate	Loblolly pine	90	131	Loblolly pine,
						Slash pine	90	--	slash pine,
						Longleaf pine	75	--	longleaf pine.
RaA---Rains	9W	Slight	Severe	Severe	Severe	Loblolly pine	90	131	Loblolly pine,
						Sweetgum	90	--	sweetgum,
						Water oak	90	--	water oak.
						Slash pine	90	--	
RbA:									
Rains	9W	Slight	Severe	Severe	Severe	Loblolly pine	90	131	Loblolly pine,
						Sweetgum	90	--	sweetgum,
						Water oak	90	--	water oak.
						Slash pine	90	--	
Bethera	9W	Slight	Severe	Severe	Severe	Loblolly pine	90	131	Loblolly pine,
						Sweetgum	90	--	Sweetgum,
						Water oak	90	--	water oak.
RdB---Red Bay	9A	Slight	Slight	Slight	Moderate	Loblolly pine	90	131	Loblolly pine,
						Slash pine	90	--	slash pine,
						Longleaf pine	75	--	longleaf pine.
SmE---Smithdale	9R	Moderate	Moderate	Slight	Slight	Loblolly pine	85	120	Loblolly pine,
						Longleaf pine	75	--	longleaf pine,
						Slash pine	85	--	slash pine.
TrB, TrD---Troup	8S	Slight	Moderate	Moderate	Moderate	Loblolly pine	80	110	Loblolly pine,
						Longleaf pine	75	--	longleaf pine.
						Slash pine	80	--	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity*	
								cu.ft/a	
TUE:									
Troup----------	8R	Moderate	Moderate	Moderate	Moderate	Loblolly pine-------	80	110	Loblolly pine, longleaf pine.
						Longleaf pine-------	75	--	
						Slash pine----------	80	--	
Luverne--------	9R	Moderate	Moderate	Slight	Moderate	Loblolly pine-------	90	131	Loblolly pine.
						Shortleaf pine------	80	--	
						Longleaf pine-------	70	--	

* Productivity is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands of loblolly pine, except for map units DaA and GrA, in which yields are based on baldcypress.

TABLE 9.--POTENTIAL UNDERSTORY PLANT COMMUNITY BY CANOPY COVER AND FORAGE VALUE FOR GRAZING ANIMALS

Map symbol and map unit name

CdB - Cowarts-Dothan complex, 2 to 5 percent slopes
CdC - Cowarts-Dothan complex, 5 to 10 percent slopes
DMA - Dothan and Malbis sandy loams, 0 to 1 percent slopes
DMB - Dothan and Malbis sandy loams, 1 to 5 percent slopes
OrA - Orangeburg sandy loam, 0 to 1 percent slopes
OrB - Orangeburg sandy loam, 1 to 5 percent slopes
OrC - Orangeburg sandy loam, 5 to 8 percent slopes

Understory plants	Grazing value *		Canopy class		
	Cattle	Deer	Sparse 1-35 percent	Medium 36-55 percent	Dense 56-70 percent
			lb/ac	lb/ac	lb/ac
Pinehill bluestem or little bluestem	P	U			
Big bluestem	P	U	1,900	800	200
Indiangrass	P	U			
Switchgrass	P	U			
Longleaf uniola	D	U			
Low panicums	D	D	100	250	350
Sedges and rushes	D	D			
Beaked panicum	D	U			
Slender bluestem	D	U	250	100	50
Low paspalums	D	U			
Perennial threeawns	U	U			
Broomsedge bluestem	U	U	50	50	---
Perennial sunflowers	P	D			
Perennial lespedezas	P	D			
Tickclovers	P	D	300	200	100
Grassleaf goldaster	D	D			
Tephrosia	D	D			
Greenbrier	D	P			
Grape	D	D			
Honeysuckle	P	P			
Huckleberry	D	D			
Dogwood	U	D			
Poison ivy	D	P			
Blackberry	U	U			
Sumac	U	U			

* See footnote at end of table.

TABLE 9.--POTENTIAL UNDERSTORY PLANT COMMUNITY BY CANOPY COVER AND FORAGE VALUE FOR GRAZING ANIMALS--Continued

Map symbol and map unit name

BnB - Blanton loamy fine sand, 0 to 5 percent slopes
BnC - Blanton loamy fine sand, 5 to 12 percent slopes
BoB - Bonifay loamy fine sand, 0 to 5 percent slopes
BoC - Bonifay loamy fine sand, 5 to 10 percent slopes
FuB - Fuquay loamy fine sand, 0 to 5 percent slopes
LuB - Lucy loamy sand, 0 to 5 percent slopes
TrB - Troup loamy sand, 0 to 5 percent slopes
TrD - Troup loamy sand, 5 to 15 percent slopes

Understory plants	Grazing value *		Canopy class		
	Cattle	Deer	Sparse 1-35 percent	Medium 36-55 percent	Dense 56-70 percent
			lb/ac	lb/ac	lb/ac
Pinehill bluestem or little bluestem	P	U			
Big bluestem	P	U	1,100	400	200
Indiangrass	P	U			
Longleaf uniola	D	U			
Low panicums	D	D	100	200	250
Sedges and rushes	D	D			
Purpletop	D	U			
Pineywoods dropseed	D	U			
Slender bluestem	D	U	200	50	---
Low paspalums	D	U			
Skeletongrass	D	U			
Perennial threeawns	U	U			
Broomsedge bluestem	U	U	50	50	---
Perennial sunflowers	P	D			
Perennial lespedezas	P	D			
Tickclovers	P	D	150	100	50
Grassleaf goldaster	D	D			
Greenbrier	D	P			
Grape	D	D			
Huckleberry	D	D			
Dogwood	U	D			
Poison ivy	D	P			
Blackberry	U	U			
Sumac	U	U			

* P, preferred species; D, desired species; U, undesired species.

TABLE 10.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
ArE---------- Arundel	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Moderate: slope.	Severe: slope.
BgA---------- Bigbee	Severe: flooding.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: droughty.
BnB---------- Blanton	Slight----------	Slight----------	Moderate: slope.	Slight----------	Moderate: droughty.
BnC---------- Blanton	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: droughty, slope.
BoB---------- Bonifay	Slight----------	Slight----------	Moderate: slope.	Slight----------	Moderate: droughty.
BoC---------- Bonifay	Slight----------	Slight----------	Severe: slope.	Slight----------	Moderate: droughty.
CaA---------- Chrysler	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
CdB:					
Cowarts----------	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.
Dothan----------	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
CdC:					
Cowarts----------	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight----------	Slight.
Dothan----------	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
CuC:					
Cowarts----------	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.
Urban land.					
DaA---------- Dorovan	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
DmA:					
Dothan----------	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
Malbis----------	Slight----------	Slight----------	Slight----------	Slight----------	Slight.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
DmB:					
Dothan	Slight	Slight	Moderate: slope.	Slight	Slight.
Malbis	Slight	Slight	Moderate: slope.	Slight	Slight.
DuC:					
Dothan	Slight	Slight	Moderate: slope.	Slight	Slight.
Urban land.					
EsC Esto	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight	Slight.
EuA Eunola	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
FoA Florala	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness, droughty.
FuB Fuquay	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
GrA Grady	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
IbA:					
Iuka	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.
KaA Kalmia	Severe: flooding.	Slight	Slight	Slight	Moderate: droughty.
LuB Lucy	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
LyA Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
MaA Maxton	Severe: flooding.	Slight	Slight	Slight	Slight.
MBA:					
Muckalee	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Bibb	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Osier	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
OrA---------- Orangeburg	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
OrB---------- Orangeburg	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
OrC---------- Orangeburg	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
OrE---------- Orangeburg	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
OuC: Orangeburg----------	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
Urban land.					
PIT: Pits.					
RaA---------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
RbA: Rains----------	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Bethera----------	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
RdB---------- Red Bay	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
SmE---------- Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
TrB---------- Troup	Slight----------	Slight----------	Moderate: slope.	Slight----------	Moderate: droughty.
TrD---------- Troup	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: droughty, slope.
TUE: Troup----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Luverne----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

TABLE 11.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
ArE---- Arundel	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BgA---- Bigbee	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.
BnB, BnC---- Blanton	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
BoB, BoC---- Bonifay	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
CaA---- Chrysler	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
CdB:										
Cowarts----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Dothan----	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CdC:										
Cowarts----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Dothan----	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CuC:										
Cowarts----	---	---	---	---	---	---	---	---	---	---
Urban land.										
DaA---- Dorovan	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
DmA, DmB:										
Dothan----	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Malbis----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
DuC:										
Dothan----	---	---	---	---	---	---	---	---	---	---
Urban land.										
EsC---- Esto	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EuA---- Eunola	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

TABLE 11.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
FoA---------- Florala	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
FuB---------- Fuquay	Fair	Fair	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
GrA---------- Grady	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
IbA:										
Iuka----------	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
Bibb----------	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
KaA---------- Kalmia	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LuB---------- Lucy	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
LyA---------- Lynchburg	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
MaA---------- Maxton	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MBA:										
Muckalee----------	Poor	Poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Bibb----------	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Osier----------	Very poor.	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Fair.
OrA, OrB---------- Orangeburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
OrC, OrE---------- Orangeburg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
OuC:										
Orangeburg--------	---	---	---	---	---	---	---	---	---	---
Urban land.										
PIT:										
Pits.										
RaA---------- Rains	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.
RbA:										
Rains----------	Poor	Poor	Poor	Fair	Fair	Good	Good	Poor	Fair	Good.
Bethera----------	Very poor.	Very poor.	Very poor.	Fair	Fair	Good	Good	Very poor.	Poor	Good.
RdB---------- Red Bay	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

TABLE 11.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
SmE---------- Smithdale	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
TrB, TrD---------- Troup	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
TUE:										
Troup----------	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Luverne----------	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

TABLE 12.--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; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
ArE--- Arundel	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
BgA--- Bigbee	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: droughty.
BnB--- Blanton	Severe: cutbanks cave.	Slight---	Moderate: wetness.	Slight---	Slight---	Moderate: droughty.
BnC--- Blanton	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope, wetness.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
BoB--- Bonifay	Severe: cutbanks cave.	Slight---	Moderate: wetness.	Slight---	Slight---	Moderate: droughty.
BoC--- Bonifay	Severe: cutbanks cave.	Slight---	Moderate: wetness.	Moderate: slope.	Slight---	Moderate: droughty.
CaA--- Chrysler	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength.	Moderate: wetness.
CdB:						
Cowarts---	Slight---	Slight---	Slight---	Slight---	Slight---	Slight.
Dothan---	Moderate: wetness.	Slight---	Moderate: wetness.	Slight---	Slight---	Slight.
CdC:						
Cowarts---	Slight---	Slight---	Slight---	Moderate: slope.	Slight---	Slight.
Dothan---	Moderate: wetness.	Slight---	Moderate: wetness.	Moderate: slope.	Slight---	Slight.
CuC:						
Cowarts---	Slight---	Slight---	Slight---	Moderate: slope.	Slight---	Slight.
Urban land.						
DaA--- Dorovan	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: ponding, excess humus.
DmA, DmB:						
Dothan---	Moderate: wetness.	Slight---	Moderate: wetness.	Slight---	Slight---	Slight.
Malbis---	Moderate: wetness.	Slight---	Moderate: wetness.	Slight---	Slight---	Slight.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
DuC:						
Dothan	Moderate: wetness.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Slight.
Urban land.						
EsC Esto	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
EuA Eunola	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Moderate: wetness.
FoA Florala	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
FuB Fuquay	Slight	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
GrA Grady	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
IbA:						
Iuka	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.
KaA Kalmia	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: droughty.
LuB Lucy	Moderate: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
LyA Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
MaA Maxton	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
MBA:						
Muckalee	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Bibb	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Osier	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.
OrA, OrB Orangeburg	Slight	Slight	Slight	Slight	Slight	Slight.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
OrC---------- Orangeburg	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
OrE---------- Orangeburg	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
OuC: Orangeburg-------	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
Urban land.						
PIT: Pits.						
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, flooding.
Bethera----------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
RdB---------- Red Bay	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
SmE---------- Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
TrB---------- Troup	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
TrD---------- Troup	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
TUE: 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.

TABLE 13.--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; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
ArE---------- 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.
BgA---------- Bigbee	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, wetness.	Severe: seepage.	Poor: seepage, too sandy.
BnB---------- Blanton	Moderate: wetness.	Severe: seepage.	Moderate: too sandy.	Severe: seepage.	Fair: too sandy.
BnC---------- Blanton	Moderate: wetness, slope.	Severe: seepage, slope.	Moderate: slope, too sandy.	Severe: seepage.	Fair: too sandy, slope.
BoB---------- Bonifay	Moderate: wetness, percs slowly.	Severe: seepage.	Moderate: too sandy.	Severe: seepage.	Fair: too sandy.
BoC---------- Bonifay	Moderate: wetness, percs slowly.	Severe: seepage, slope.	Moderate: too sandy.	Severe: seepage.	Fair: too sandy.
CaA---------- Chrysler	Severe: wetness, percs slowly.	Slight----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
CdB:					
Cowarts----------	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Good.
Dothan----------	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Moderate: wetness.	Slight----------	Good.
CdC:					
Cowarts----------	Severe: percs slowly.	Severe: slope.	Slight----------	Slight----------	Good.
Dothan----------	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness.	Slight----------	Good.
CuC:					
Cowarts----------	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Good.
Urban land.					
DaA---------- Dorovan	Severe: flooding, ponding.	Severe: flooding, excess humus, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: ponding, excess humus.

TABLE 13.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
DmA:					
Dothan	Severe: wetness, percs slowly.	Moderate: seepage.	Moderate: wetness.	Slight	Good.
Malbis	Severe: wetness, percs slowly.	Moderate: seepage.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
DmB:					
Dothan	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Moderate: wetness.	Slight	Good.
Malbis	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
DuC:					
Dothan	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Moderate: wetness.	Slight	Good.
Urban land.					
EsC Esto	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
EuA Eunola	Severe: wetness.	Severe: seepage, flooding, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness, thin layer.
FoA Florala	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Fair: wetness.
FuB Fuquay	Moderate: percs slowly.	Moderate: slope.	Slight	Slight	Fair: too sandy.
GrA Grady	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
IbA:					
Iuka	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
Bibb	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
KaA Kalmia	Slight	Severe: seepage, flooding.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
LuB Lucy	Slight	Severe: seepage.	Slight	Severe: seepage.	Good.

TABLE 13.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LyA---------- Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
MaA---------- Maxton	Slight----------	Severe: seepage, flooding.	Severe: seepage, too sandy.	Severe: seepage.	Fair: thin layer.
MBA: Muckalee----------	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: wetness.
Osier----------	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, seepage.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
OrA---------- Orangeburg	Slight----------	Moderate: seepage.	Slight----------	Slight----------	Good.
OrB, OrC---------- Orangeburg	Slight----------	Moderate: seepage, slope.	Slight----------	Slight----------	Good.
OrE---------- Orangeburg	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
OuC: Orangeburg---------	Slight----------	Moderate: seepage, slope.	Slight----------	Slight----------	Good.
Urban land.					
PIT: Pits.					
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, seepage, 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.
RdB---------- Red Bay	Slight----------	Moderate: seepage, slope.	Slight----------	Slight----------	Good.

TABLE 13.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SmE---------- Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
TrB---------- Troup	Slight----------	Severe: seepage.	Moderate: too sandy.	Severe: seepage.	Poor: seepage.
TrD---------- Troup	Moderate: slope.	Severe: seepage, slope.	Moderate: slope, too sandy.	Severe: seepage.	Poor: seepage.
TUE:					
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.

TABLE 14.--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; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
ArE---- Arundel	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
BgA---- Bigbee	Good----	Probable----	Improbable: too sandy.	Poor: too sandy.
BnB---- Blanton	Good----	Probable----	Improbable: too sandy.	Fair: too sandy.
BnC---- Blanton	Good----	Probable----	Improbable: too sandy.	Fair: too sandy, slope.
BoB, BoC---- Bonifay	Good----	Probable----	Improbable: too sandy.	Fair: too sandy.
CaA---- Chrysler	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
CdB, CdC: Cowarts----	Good----	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Dothan----	Good----	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
CuC: Cowarts----	Good----	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Urban land.				
DaA---- Dorovan	Poor: wetness.	Probable----	Improbable: too sandy.	Poor: excess humus, wetness.
DmA, DmB: Dothan----	Good----	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
Malbis----	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
DuC: Dothan----	Good----	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
Urban land.				
EsC---- Esto	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
EuA---- Eunola	Fair: wetness.	Probable----	Improbable: too sandy.	Good.
FoA---- Florala	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
FuB---- Fuquay	Good----	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
GrA---- Grady	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, too clayey.
IbA:				
Iuka----	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Bibb----	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
KaA---- Kalmia	Good----	Probable----	Improbable: too sandy.	Fair: too sandy, thin layer.
LuB---- Lucy	Good----	Improbable: excess fines, thin layer.	Improbable: excess fines.	Fair: too sandy.
LyA---- Lynchburg	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
MaA---- Maxton	Good----	Probable----	Improbable: too sandy.	Fair: thin layer.
MBA:				
Muckalee----	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Bibb----	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Osier----	Poor: wetness.	Probable----	Improbable: too sandy.	Poor: wetness.
OrA, OrB, OrC---- Orangeburg	Good----	Improbable: excess fines.	Improbable: excess fines.	Good.
OrE---- Orangeburg	Good----	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
OuC:				
Orangeburg----	Good----	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
PIT:				
Pits.				
RaA---- Rains	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
RbA:				
Rains	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Bethera	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
RdB Red Bay	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
SmE Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
TrB Troup	Good	Probable	Improbable: too sandy.	Fair: too sandy.
TrD Troup	Good	Probable	Improbable: too sandy.	Fair: too sandy, slope.
TUE:				
Troup	Fair: slope.	Probable	Improbable: too sandy.	Poor: slope.
Luverne	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.

TABLE 15.--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; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
ArE---------- Arundel	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, fast intake, percs slowly.	Slope, depth to rock.	Slope, depth to rock.
BgA---------- Bigbee	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy------	Droughty.
BnB---------- Blanton	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Soil blowing---	Droughty.
BnC---------- Blanton	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Slope, soil blowing.	Slope, droughty.
BoB, BoC---------- Bonifay	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Soil blowing---	Droughty.
CaA---------- Chrysler	Slight---------	Severe: hard to pack, wetness.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.	Percs slowly.
CdB, CdC:						
Cowarts----------	Moderate: slope.	Moderate: piping.	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly.
Dothan----------	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
CuC:						
Cowarts----------	Moderate: slope.	Moderate: piping.	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly.
Urban land.						
DaA---------- Dorovan	Moderate: seepage.	Severe: excess humus, ponding.	Ponding, flooding, subsides.	Ponding, flooding.	Ponding--------	Wetness.
DmA:						
Dothan----------	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable------	Favorable------	Favorable.
Malbis----------	Moderate: seepage.	Severe: piping.	Deep to water	Favorable------	Favorable------	Favorable.
DmB:						
Dothan----------	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
Malbis----------	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.

TABLE 15.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
DuC: Dothan	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope	Favorable	Favorable.
Urban land.						
EsC: Esto	Moderate: slope.	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Percs slowly	Percs slowly.
EuA: Eunola	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness	Wetness	Favorable.
FoA: Florala	Moderate: seepage.	Severe: piping, wetness.	Percs slowly	Wetness, droughty.	Wetness, soil blowing.	Droughty, percs slowly.
FuB: Fuquay	Slight	Slight	Deep to water	Droughty, fast intake.	Too sandy	Droughty.
GrA: Grady	Slight	Severe: ponding.	Ponding, percs slowly.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
IbA: Iuka	Moderate: seepage.	Severe: piping, wetness.	Flooding	Wetness, flooding.	Wetness	Wetness.
Bibb	Moderate: seepage.	Severe: piping, wetness.	Flooding	Wetness, flooding.	Wetness	Wetness.
KaA: Kalmia	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy	Droughty.
LuB: Lucy	Severe: seepage.	Moderate: piping.	Deep to water	Droughty, fast intake.	Too sandy	Droughty.
LyA: Lynchburg	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness	Wetness	Wetness.
MaA: Maxton	Severe: seepage.	Slight	Deep to water	Favorable	Favorable	Favorable.
MBA: Muckalee	Moderate: seepage.	Severe: piping, wetness.	Flooding, cutbanks cave.	Wetness, droughty, flooding.	Wetness, too sandy.	Wetness, droughty.
Bibb	Moderate: seepage.	Severe: piping, wetness.	Flooding	Wetness, flooding.	Wetness	Wetness.
Osier	Severe: seepage.	Severe: seepage, piping, wetness.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.

TABLE 15.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
OrA---------- Orangeburg	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable------	Favorable------	Favorable.
OrB, OrC---------- Orangeburg	Moderate: seepage.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
OrE---------- Orangeburg	Moderate: seepage.	Moderate: piping.	Deep to water	Slope----------	Slope----------	Slope.
OuC: Orangeburg-------	Moderate: seepage.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
Urban land.						
PIT: Pits.						
RaA---------- Rains	Moderate: seepage.	Severe: piping, wetness.	Flooding-------	Wetness, flooding.	Wetness--------	Wetness.
RbA: Rains----------	Moderate: seepage.	Severe: piping, wetness.	Favorable------	Wetness--------	Wetness--------	Wetness.
Bethera----------	Slight---------	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.
RdB---------- Red Bay	Moderate: seepage, slope.	Slight---------	Deep to water	Slope----------	Favorable------	Favorable.
SmE---------- Smithdale	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
TrB---------- Troup	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy------	Droughty.
TrD---------- Troup	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, slope.	Slope, too sandy.	Slope, droughty.
TUE: 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.

TABLE 16.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. Some soils may have Unified classifications and USDA textures in addition to those shown. In general, the dominant classifications and textures are shown]

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
ArE----------	0-6	Loamy fine sand	SM	A-2, A-4	0-6	85-100	80-95	60-90	19-45	---	NP
Arundel	6-30	Silty clay loam, silty clay, clay.	CL, CH, MH	A-7	0-15	85-100	80-100	80-100	65-90	44-75	22-45
	30-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
BgA----------	0-10	Loamy sand-------	SM	A-2-4	0	100	95-100	60-90	15-30	---	NP
Bigbee	10-80	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	85-100	85-100	50-75	5-20	---	NP
BnB----------	0-62	Loamy fine sand	SM	A-2-4	0	100	95-100	85-100	13-25	---	NP
Blanton	62-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, SM	A-4, A-2-4, A-2-6, A-6	0	100	95-100	69-100	25-50	<45	NP-22
BnC----------	0-54	Loamy fine sand	SM	A-2-4	0	100	95-100	85-100	13-25	---	NP
Blanton	54-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, SM	A-4, A-2-4, A-2-6, A-6	0	100	95-100	69-100	25-50	<45	NP-22
BoB----------	0-52	Loamy fine sand	SM	A-2-4	0	98-100	98-100	65-95	13-20	---	NP
Bonifay	52-72	Sandy loam, sandy clay loam, fine sandy loam.	SM-SC, SC, SM	A-2-4, A-4, A-2-6, A-6	0	95-100	90-100	63-95	23-50	<30	NP-12
BoC----------	0-50	Loamy fine sand	SM	A-2-4	0	98-100	98-100	65-95	13-20	---	NP
Bonifay	50-70	Sandy loam, sandy clay loam, fine sandy loam.	SM-SC, SC, SM	A-2-4, A-4, A-2-6, A-6	0	95-100	90-100	63-95	23-50	<30	NP-12
CaA----------	0-10	Sandy loam-------	SM, ML	A-4	0	95-100	95-100	70-100	40-75	<30	NP-7
Chrysler	10-68	Silty clay loam, silty clay, clay.	CL, ML, CH, MH	A-7	0	95-100	95-100	90-100	85-100	45-70	15-35
CdB:											
Cowarts---------	0-6	Loamy sand-------	SM	A-2	0	90-100	85-100	50-80	13-30	---	NP
	6-18	Fine sandy loam, sandy loam, sandy clay loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	90-100	60-90	23-46	20-40	NP-15
	18-28	Sandy clay loam, sandy clay.	SM-SC, SM, SC	A-6, A-7	0	95-100	90-100	60-90	25-50	30-54	11-23
	28-60	Sandy loam, sandy clay loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	0	85-100	80-100	60-95	30-58	25-53	5-20
Dothan----------	0-12	Fine sandy loam	SM, SM-SC	A-2, A-4	0	95-100	92-100	75-90	20-40	<25	NP-5
	12-46	Sandy clay loam, sandy loam, fine sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	92-100	68-90	23-49	<40	NP-16
	46-60	Sandy clay loam, sandy clay.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	0	95-100	92-100	70-95	30-53	25-45	4-23

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CdC:											
Cowarts	0-5	Loamy sand	SM	A-2	0	90-100	85-100	50-80	13-30	---	NP
	5-25	Sandy clay loam, sandy clay.	SM-SC, SM, SC	A-6, A-7	0	95-100	90-100	60-90	25-50	30-54	11-23
	25-60	Sandy loam, sandy clay loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	0	85-100	80-100	60-95	30-58	25-53	5-20
Dothan	0-6	Fine sandy loam	SM, SM-SC	A-2, A-4	0	95-100	92-100	75-90	20-40	<25	NP-5
	6-42	Sandy clay loam, sandy loam, fine sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	92-100	68-90	23-49	<40	NP-16
	42-60	Sandy clay loam, sandy clay.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	0	95-100	92-100	70-95	30-53	25-45	4-23
CuC:											
Cowarts	0-6	Loamy sand	SM	A-2	0	90-100	85-100	50-80	13-30	---	NP
	6-23	Sandy clay loam, sandy clay.	SM-SC, SM, SC	A-6, A-7	0	95-100	90-100	60-90	25-50	30-54	11-23
	23-60	Sandy loam, sandy clay loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	0	85-100	80-100	60-95	30-58	25-53	5-20
Urban land.											
DaA	0-1	Mucky peat	PT	---	0	---	---	---	---	---	---
Dorovan	1-70	Muck	PT	---	0	---	---	---	---	---	---
DmA:											
Dothan	0-10	Fine sandy loam	SM, SM-SC	A-2, A-4	0	95-100	92-100	75-90	20-40	<25	NP-5
	10-48	Sandy clay loam, sandy loam, fine sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	92-100	68-90	23-49	<40	NP-16
	48-60	Sandy clay loam, sandy clay.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	0	95-100	92-100	70-95	30-53	25-45	4-23
Malbis	0-10	Fine sandy loam	SM, ML	A-4	0	100	97-100	91-97	40-62	<30	NP-5
	10-24	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
	24-48	Sandy clay loam, clay loam, loam.	ML, CL	A-4, A-6, A-7	0	98-100	96-100	90-100	56-80	29-49	4-15
	48-72	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
DmB:											
Dothan	0-12	Fine sandy loam	SM, SM-SC	A-2, A-4	0	95-100	92-100	75-90	20-40	<25	NP-5
	12-44	Sandy clay loam, sandy loam, fine sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	92-100	68-90	23-49	<40	NP-16
	44-75	Sandy clay loam, sandy clay.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	0	95-100	92-100	70-95	30-53	25-45	4-23
Malbis	0-9	Fine sandy loam	SM, ML	A-4	0	100	97-100	91-97	40-62	<30	NP-5
	9-22	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
	22-46	Sandy clay loam, clay loam, loam.	ML, CL	A-4, A-6, A-7	0	98-100	96-100	90-100	56-80	29-49	4-15
	46-72	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

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
DuC:											
Dothan----------	0-8	Fine sandy loam	SM, SM-SC	A-2, A-4	0	95-100	92-100	75-90	20-40	<25	NP-5
	8-48	Sandy clay loam, sandy loam, fine sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	92-100	68-90	23-49	<40	NP-16
	48-66	Sandy clay loam, sandy clay.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	0	95-100	92-100	70-95	30-53	25-45	4-23
Urban land.											
EsC----------	0-4	Sandy loam-------	SM, SM-SC, ML, CL-ML	A-4, A-2	0	95-100	85-100	70-96	25-55	<25	NP-6
Esto	4-60	Clay loam, clay, sandy clay.	CL, CH	A-7	0	95-100	85-100	85-100	51-98	40-80	18-52
EuA----------	0-5	Fine sandy loam	SM	A-2, A-4	0	100	98-100	60-85	30-50	---	NP
Eunola	5-24	Sandy clay loam	SM, SC, SM-SC	A-4, A-2	0	100	98-100	75-95	30-45	<30	NP-10
	24-44	Sandy clay loam, sandy clay.	SM, SC, ML, CL	A-4, A-6	0	100	98-100	80-95	36-60	<30	2-15
	44-60	Sandy loam-------	SM	A-2, A-4	0	100	98-100	60-70	30-40	---	NP
FoA----------	0-8	Sandy loam-------	SM, SM-SC	A-2, A-4	0	98-100	95-100	70-90	20-50	<25	NP-7
Florala	8-36	Fine sandy loam, sandy loam.	SM	A-2, A-4	0	98-100	95-100	60-90	30-50	<30	NP-7
	36-72	Fine sandy loam, sandy loam, sandy clay loam.	SC, SM-SC	A-4, A-6	0	95-100	95-100	55-85	35-50	20-35	4-15
FuB----------	0-30	Loamy fine sand	SP-SM, SM	A-2, A-3	0	95-100	90-100	50-83	5-35	---	NP
Fuquay	30-37	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	85-100	85-100	70-90	23-45	<25	NP-13
	37-66	Sandy clay loam	SC, SM-SC, CL-ML, SM	A-2, A-4, A-6, A-7-6	0	95-100	90-100	58-90	28-49	20-49	4-14
GrA----------	0-18	Sandy loam-------	SM, SM-SC, SC	A-2, A-4	0	100	99-100	85-100	25-50	<20	NP-10
Grady	18-60	Clay, sandy clay	CL, CH, MH	A-6, A-7	0	100	100	90-100	55-90	30-51	12-24
IbA:											
Iuka----------	0-9	Sandy loam-------	SM, SM-SC, ML, CL-ML	A-4, A-2	0	95-100	90-100	70-100	30-60	<20	NP-7
	9-34	Fine sandy loam, loam, sandy loam.	SM, SM-SC, ML, CL-ML	A-4	0	95-100	85-100	65-100	36-75	<30	NP-7
	34-60	Sandy loam, fine sandy loam, loam.	SM, ML	A-2, A-4	0	95-100	90-100	70-100	25-60	<30	NP-7
Bibb----------	0-40	Sandy loam-------	SM, SM-SC, ML, CL-ML	A-2, A-4	0-5	95-100	90-100	60-90	30-60	<25	NP-7
	40-60	Sandy loam, loam, silt loam.	SM, SM-SC, ML, CL-ML	A-2, A-4	0-10	60-100	50-100	40-100	30-90	<30	NP-7
KaA----------	0-8	Loamy fine sand	SM, SM-SC	A-2	0	100	95-100	50-75	15-35	---	NP
Kalmia	8-34	Sandy clay loam, loam, sandy loam.	SC, SM-SC	A-2, A-4, A-6	0	100	95-100	70-100	30-49	20-35	4-15
	34-60	Loamy sand, sand	SM, SP-SM, SP	A-2, A-3	0	100	95-100	50-70	4-35	---	NP

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
LuB---------- Lucy	0-29	Loamy sand-------	SM, SP-SM	A-2	0	98-100	95-100	50-87	10-30	---	NP
	29-35	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	97-100	95-100	55-95	15-50	<30	NP-15
	35-60	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, SM	A-2, A-6, A-4	0	100	95-100	60-95	20-50	20-40	3-20
LyA---------- Lynchburg	0-16	Sandy loam-------	SM, ML, SM-SC, CL-ML	A-2, A-4	0	92-100	90-100	75-100	25-55	<30	NP-7
	16-65	Sandy clay loam, sandy loam, clay loam.	SM-SC, SC, CL, CL-ML	A-2, A-4, A-6	0	92-100	90-100	70-100	25-67	16-40	4-18
MaA---------- Maxton	0-15	Sandy loam-------	SM, SM-SC	A-2	0-3	90-100	85-100	65-90	20-35	<25	NP-7
	15-34	Sandy clay loam, sandy loam.	SC, SM-SC	A-4, A-6, A-2	0-3	90-100	85-100	75-90	30-49	20-35	4-15
	34-60	Stratified loamy sand to sand.	SM, SP-SM, SP	A-2, A-3	0-3	90-100	75-100	50-90	4-25	---	NP
MBA: Muckalee--------	0-10	Sandy loam-------	ML, SC, SM, SM-SC	A-2, A-4	0	95-100	90-100	50-95	30-60	<30	NP-10
	10-60	Sandy loam, loamy sand.	SM	A-2, A-4	0	95-100	80-100	60-90	20-40	<20	NP-4
Bibb----------	0-38	Loam----------	ML, CL-ML	A-4	0-5	95-100	90-100	80-90	50-80	<25	NP-7
	38-65	Sandy loam, loam, silt loam.	SM, SM-SC, ML, CL-ML	A-2, A-4	0-10	60-100	50-100	40-100	30-90	<30	NP-7
Osier----------	0-19	Loamy sand-------	SP-SM	A-2, A-3	0	100	98-100	60-85	5-12	---	NP
	19-54	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2, A-3	0	100	95-100	65-96	5-20	---	NP
	54-60	Coarse sand, sand, fine sand.	SP, SP-SM	A-1, A-3, A-2-4	0	100	90-100	40-60	2-10	---	NP
OrA---------- Orangeburg	0-8	Sandy loam-------	SM	A-2	0	98-100	95-100	75-95	20-35	---	NP
	8-18	Sandy loam-------	SM	A-2	0	98-100	95-100	70-96	25-35	<30	NP-4
	18-48	Sandy clay loam, sandy loam.	SC, CL, SM, SM-SC	A-6, A-4	0	98-100	95-100	71-96	38-58	22-40	3-19
	48-72	Sandy clay loam, sandy clay, sandy loam.	SC, CL	A-6, A-4, A-7	0	98-100	95-100	70-97	40-65	24-46	8-21
OrB---------- Orangeburg	0-8	Sandy loam-------	SM	A-2	0	98-100	95-100	75-95	20-35	---	NP
	8-14	Sandy loam-------	SM	A-2	0	98-100	95-100	70-96	25-35	<30	NP-4
	14-48	Sandy clay loam, sandy loam.	SC, CL, SM, SM-SC	A-6, A-4	0	98-100	95-100	71-96	38-58	22-40	3-19
	48-60	Sandy clay loam, sandy clay, sandy loam.	SC, CL	A-6, A-4, A-7	0	98-100	95-100	70-97	40-65	24-46	8-21
OrC---------- Orangeburg	0-6	Sandy loam-------	SM	A-2	0	98-100	95-100	75-95	20-35	---	NP
	6-40	Sandy clay loam, sandy loam.	SC, CL, SM, SM-SC	A-6, A-4	0	98-100	95-100	71-96	38-58	22-40	3-19
	40-60	Sandy clay loam, sandy clay, sandy loam.	SC, CL	A-6, A-4, A-7	0	98-100	95-100	70-97	40-65	24-46	8-21

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
OrE----------	0-5	Sandy loam-------	SM	A-2	0	98-100	95-100	75-95	20-35	---	NP
Orangeburg	5-28	Sandy clay loam, sandy loam.	SC, CL, SM, SM-SC	A-6, A-4	0	98-100	95-100	71-96	38-58	22-40	3-19
	28-60	Sandy clay loam, sandy clay, sandy loam.	SC, CL	A-6, A-4, A-7	0	98-100	95-100	70-97	40-65	24-46	8-21
OuC:											
Orangeburg------	0-8	Sandy loam-------	SM	A-2	0	98-100	95-100	75-95	20-35	---	NP
	8-14	Sandy loam-------	SM	A-2	0	98-100	95-100	70-96	25-35	<30	NP-4
	14-38	Sandy clay loam, sandy loam.	SC, CL, SM, SM-SC	A-6, A-4	0	98-100	95-100	71-96	38-58	22-40	3-19
	38-60	Sandy clay loam, sandy clay, sandy loam.	SC, CL	A-6, A-4, A-7	0	98-100	95-100	70-97	40-65	24-46	8-21
Urban land.											
PIT:											
Pits											
RaA----------	0-20	Sandy loam-------	SM, ML	A-2, A-4	0	100	95-100	50-85	25-56	<35	NP-10
Rains	20-45	Sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	55-98	30-70	18-40	4-20
	45-65	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7	0	100	98-100	60-98	36-72	18-45	4-28
RbA:											
Rains----------	0-8	Loam----------	SM, ML, SC, CL	A-4, A-6	0	95-100	92-100	55-98	40-70	<35	NP-12
	8-48	Sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	98-100	95-100	55-98	30-70	18-40	4-20
	48-69	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7	0	98-100	95-100	60-98	36-72	18-45	4-28
Bethera---------	0-18	Sandy loam-------	SM, ML, SM-SC, CL-ML	A-4	0	100	98-100	70-85	40-55	<26	NP-6
	18-76	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
RdB----------	0-11	Sandy loam-------	SM, SM-SC	A-2, A-4	0	100	95-100	60-85	15-45	<20	NP-4
Red Bay	11-42	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4	0	100	95-100	60-85	15-50	<35	NP-10
	42-72	Sandy clay loam	SM-SC, SC	A-2, A-4, A-6	0	100	95-100	70-90	24-50	18-40	4-16
SmE----------	0-11	Sandy loam-------	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
Smithdale	11-46	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	46-60	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
TrB----------	0-47	Loamy sand-------	SM, SP-SM	A-2, A-4	0	95-100	90-100	50-90	10-40	---	NP
Troup	47-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2, A-6	0	95-100	90-100	60-90	24-55	19-40	4-20

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
TrD----------	0-50	Loamy sand-------	SM, SP-SM	A-2, A-4	0	95-100	90-100	50-90	10-40	---	NP
Troup	50-72	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2, A-6	0	95-100	90-100	60-90	24-55	19-40	4-20
TUE:											
Troup----------	0-60	Loamy sand-------	SM, SP-SM	A-2, A-4	0	95-100	90-100	50-90	10-40	---	NP
	60-72	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2, A-6	0	95-100	90-100	60-90	24-55	19-40	4-20
Luverne---------	0-12	Sandy loam-------	ML, SM	A-4, A-2	0-5	87-100	84-100	80-100	30-60	<20	NP
	12-28	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
	28-44	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
	44-60	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

TABLE 17.--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]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
ArE	0-6	2-12	1.40-1.70	2.0-6.0	0.06-0.12	3.6-5.5	Low	0.28	2	.5-1
Arundel	6-30	35-78	1.55-1.65	<0.06	0.12-0.18	3.6-4.4	High	0.32		
	30-60	---	---	---	---	---	---	---		
BgA	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	0.10		
BnB	0-62	5-13	1.35-1.60	6.0-20	0.05-0.10	4.5-6.0	Low	0.10	5	.5-2
Blanton	62-80	12-30	1.60-1.70	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.20		
BnC	0-54	5-13	1.35-1.60	6.0-20	0.05-0.10	4.5-6.0	Low	0.10	5	.5-2
Blanton	54-80	12-30	1.60-1.70	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.20		
BoB	0-52	6-12	1.50-1.60	6.0-20	0.05-0.10	4.5-6.5	Low	0.10	5	1-4
Bonifay	52-72	15-35	1.60-1.70	0.6-2.0	0.10-0.15	4.5-6.5	Low	0.24		
BoC	0-50	6-12	1.50-1.60	6.0-20	0.05-0.10	4.5-6.5	Low	0.10	5	1-4
Bonifay	50-70	15-35	1.60-1.70	0.6-2.0	0.10-0.15	4.5-6.5	Low	0.24		
CaA	0-10	10-20	1.35-1.55	0.6-2.0	0.12-0.16	4.5-5.5	Low	0.28	5	.5-2
Chrysler	10-68	35-60	1.20-1.50	0.06-0.2	0.14-0.18	4.5-5.5	Moderate	0.32		
CdB:										
Cowarts	0-6	5-20	1.30-1.65	2.0-6.0	0.08-0.13	4.5-5.5	Low	0.15	4	<1
	6-18	10-30	1.30-1.50	0.6-2.0	0.10-0.14	4.5-5.5	Low	0.28		
	18-28	25-40	1.30-1.50	0.2-2.0	0.10-0.16	4.5-5.5	Low	0.28		
	28-60	18-35	1.45-1.75	0.06-0.6	0.08-0.12	4.5-5.5	Low	0.24		
Dothan	0-12	10-18	1.30-1.70	2.0-6.0	0.08-0.13	4.5-6.0	Very low	0.24	5	.5-1
	12-46	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Low	0.28		
	46-60	18-40	1.45-1.70	0.2-0.6	0.08-0.12	4.5-6.0	Low	0.28		
CdC:										
Cowarts	0-5	5-20	1.30-1.65	2.0-6.0	0.08-0.13	4.5-5.5	Low	0.15	4	<1
	5-25	25-40	1.30-1.50	0.2-2.0	0.10-0.16	4.5-5.5	Low	0.28		
	25-60	18-35	1.45-1.75	0.06-0.6	0.08-0.12	4.5-5.5	Low	0.24		
Dothan	0-6	10-18	1.30-1.70	2.0-6.0	0.08-0.13	4.5-6.0	Very low	0.24	5	.5-1
	6-42	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Low	0.28		
	42-60	18-40	1.45-1.70	0.2-0.6	0.08-0.12	4.5-6.0	Low	0.28		
CuC:										
Cowarts	0-6	5-20	1.30-1.65	2.0-6.0	0.08-0.13	4.5-5.5	Low	0.15	4	<1
	6-23	25-40	1.30-1.50	0.2-2.0	0.10-0.16	4.5-5.5	Low	0.28		
	23-60	18-35	1.45-1.75	0.06-0.6	0.08-0.12	4.5-5.5	Low	0.24		
Urban land.										
DaA	0-1	---	0.25-0.40	0.6-2.0	0.25-0.50	3.6-4.4	---	---	---	---
Dorovan	1-70	---	0.35-0.55	0.6-2.0	0.25-0.50	3.6-4.4	---	---		

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
DmA:										
Dothan----------	0-10	10-18	1.30-1.70	2.0-6.0	0.08-0.13	4.5-6.0	Very low-----	0.24	5	.5-1
	10-48	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Low----------	0.28		
	48-60	18-40	1.45-1.70	0.2-0.6	0.08-0.12	4.5-6.0	Low----------	0.28		
Malbis----------	0-10	10-25	1.30-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.24	5	.5-1
	10-24	18-33	1.30-1.70	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.28		
	24-48	20-35	1.40-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.28		
	48-72	20-35	1.45-1.70	0.2-0.6	0.06-0.12	4.5-5.5	Low----------	0.28		
DmB:										
Dothan----------	0-12	10-18	1.30-1.70	2.0-6.0	0.08-0.13	4.5-6.0	Very low-----	0.24	5	.5-1
	12-44	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Low----------	0.28		
	44-75	18-40	1.45-1.70	0.2-0.6	0.08-0.12	4.5-6.0	Low----------	0.28		
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
	9-22	18-33	1.30-1.70	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.28		
	22-46	20-35	1.40-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.28		
	46-72	20-35	1.45-1.70	0.2-0.6	0.06-0.12	4.5-5.5	Low----------	0.28		
DuC:										
Dothan----------	0-8	10-18	1.30-1.70	2.0-6.0	0.08-0.13	4.5-6.0	Very low-----	0.24	5	.5-1
	8-48	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Low----------	0.28		
	48-66	18-40	1.45-1.70	0.2-0.6	0.08-0.12	4.5-6.0	Low----------	0.28		
Urban land.										
EsC----------	0-4	8-20	1.45-1.65	2.0-6.0	0.11-0.15	4.5-5.5	Low----------	0.28	4	<1
Esto	4-60	35-60	1.50-1.65	0.06-0.2	0.12-0.18	4.5-5.5	Moderate-----	0.32		
EuA----------	0-5	10-17	1.35-1.65	2.0-6.0	0.10-0.14	4.5-5.5	Low----------	0.20	5	.5-2
Eunola	5-24	18-35	1.35-1.65	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.28		
	24-44	18-45	1.30-1.60	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.32		
	44-60	8-17	1.35-1.65	2.0-6.0	0.10-0.14	4.5-5.5	Low----------	0.24		
FoA----------	0-8	7-14	1.30-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.20	5	.5-2
Florala	8-36	8-18	1.40-1.70	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24		
	36-72	8-27	1.45-1.60	0.06-0.2	0.11-0.17	4.5-5.5	Low----------	0.28		
FuB----------	0-30	2-10	1.60-1.70	>6.0	0.04-0.09	4.5-6.0	Low----------	0.10	5	.5-2
Fuquay	30-37	10-35	1.40-1.60	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.20		
	37-66	20-35	1.40-1.60	0.06-0.2	0.10-0.13	4.5-6.0	Low----------	0.20		
GrA----------	0-18	15-20	1.25-1.45	0.6-2.0	0.10-0.15	3.6-5.5	Low----------	0.10	5	1-4
Grady	18-60	45-65	1.50-1.60	0.06-0.2	0.12-0.16	3.6-5.5	Moderate-----	0.10		
IbA:										
Iuka----------	0-9	6-15	---	2.0-6.0	0.10-0.15	5.1-6.0	Low----------	0.24	5	.5-2
	9-34	8-18	---	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.28		
	34-60	5-15	---	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.20		
Bibb----------	0-40	2-18	1.25-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.20	5	.5-2
	40-60	2-18	1.30-1.60	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.37		
KaA----------	0-8	4-12	1.60-1.75	2.0-6.0	0.06-0.10	4.5-6.0	Low----------	0.15	5	.5-2
Kalmia	8-34	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.24		
	34-60	2-10	1.60-1.75	6.0-20	0.03-0.06	4.5-5.5	Low----------	0.10		
LuB----------	0-29	1-12	1.30-1.70	6.0-20	0.06-0.10	5.1-6.0	Low----------	0.15	5	.5-1
Lucy	29-35	10-30	1.40-1.60	2.0-6.0	0.10-0.12	4.5-5.5	Low----------	0.24		
	35-60	15-35	1.40-1.60	0.6-2.0	0.12-0.14	4.5-5.5	Low----------	0.28		

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
LyA----------	0-16	5-20	1.30-1.60	2.0-6.0	0.09-0.13	3.6-5.5	Low----------	0.20	5	.5-5
Lynchburg	16-65	18-35	1.30-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.20		
MaA----------	0-15	6-15	1.55-1.65	2.0-6.0	0.10-0.14	4.5-6.0	Low----------	0.20	5	.5-2
Maxton	15-34	18-35	1.40-1.60	0.6-2.0	0.13-0.18	4.5-5.5	Low----------	0.24		
	34-60	0-10	1.60-1.75	6.0-20	0.03-0.06	4.5-5.5	Low----------	0.10		
MBA:										
Muckalee--------	0-10	10-25	---	0.6-2.0	0.09-0.15	5.1-7.3	Low----------	0.20	5	.5-2
	10-60	5-20	---	0.6-2.0	0.08-0.12	5.6-8.4	Low----------	0.20		
Bibb----------	0-38	2-18	1.20-1.55	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.28	5	.5-2
	38-65	2-18	1.30-1.60	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.37		
Osier----------	0-19	1-10	1.35-1.60	6.0-20	0.03-0.10	3.6-6.0	Low----------	0.10	5	2-5
	19-54	1-10	1.40-1.60	6.0-20	0.03-0.10	3.6-6.0	Low----------	0.10		
	54-60	2-5	1.40-1.60	>20	0.02-0.05	3.6-6.0	Low----------	0.05		
OrA----------	0-8	7-15	1.30-1.50	2.0-6.0	0.07-0.10	4.5-6.0	Low----------	0.20	5	.5-2
Orangeburg	8-18	7-18	1.50-1.65	2.0-6.0	0.09-0.12	4.5-6.0	Low----------	0.20		
	18-48	18-35	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
	48-72	20-45	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
OrB----------	0-8	7-15	1.30-1.50	2.0-6.0	0.07-0.10	4.5-6.0	Low----------	0.20	5	.5-2
Orangeburg	8-14	7-18	1.50-1.65	2.0-6.0	0.09-0.12	4.5-6.0	Low----------	0.20		
	14-48	18-35	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
	48-60	20-45	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
OrC----------	0-6	7-15	1.30-1.50	2.0-6.0	0.07-0.10	4.5-6.0	Low----------	0.20	5	.5-2
Orangeburg	6-40	18-35	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
	40-60	20-45	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
OrE----------	0-5	7-15	1.30-1.50	2.0-6.0	0.07-0.10	4.5-6.0	Low----------	0.20	5	.5-2
Orangeburg	5-28	18-35	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
	28-60	20-45	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
OuC:										
Orangeburg------	0-8	7-15	1.30-1.50	2.0-6.0	0.07-0.10	4.5-6.0	Low----------	0.20	5	.5-2
	8-14	7-18	1.50-1.65	2.0-6.0	0.09-0.12	4.5-6.0	Low----------	0.20		
	14-38	18-35	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
	38-60	20-45	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
Urban land.										
PIT:										
Pits										
RaA----------	0-20	5-20	1.30-1.60	2.0-6.0	0.10-0.14	3.6-6.5	Low----------	0.20	5	1-6
Rains	20-45	18-35	1.30-1.50	0.6-2.0	0.11-0.15	3.6-5.5	Low----------	0.24		
	45-65	18-40	1.30-1.50	0.6-2.0	0.10-0.15	3.6-5.5	Low----------	0.28		
RbA:										
Rains----------	0-8	7-24	1.30-1.60	2.0-6.0	0.10-0.15	4.5-6.5	Low----------	0.28	5	1-6
	8-48	18-35	1.30-1.50	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.24		
	48-69	18-40	1.30-1.50	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.28		
Bethera---------	0-18	5-20	1.30-1.50	0.6-2.0	0.11-0.16	3.6-6.0	Low----------	0.24	5	1-6
	18-76	35-50	1.10-1.50	0.06-0.6	0.14-0.18	3.6-6.0	Moderate-----	0.32		

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
RdB----------	0-11	7-20	1.40-1.55	2.0-6.0	0.07-0.14	4.5-6.0	Low----------	0.20	5	<2
Red Bay	11-42	10-25	1.30-1.60	0.6-6.0	0.10-0.14	4.5-6.0	Low----------	0.15		
	42-72	18-35	1.30-1.50	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.17		
SmE----------	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
Smithdale	11-46	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	46-60	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
TrB----------	0-47	2-12	1.30-1.70	6.0-20	0.08-0.12	4.5-6.0	Very low-----	0.10	5	<1
Troup	47-80	15-35	1.40-1.60	0.6-2.0	0.10-0.13	4.5-5.5	Low----------	0.20		
TrD----------	0-50	2-12	1.30-1.70	6.0-20	0.08-0.12	4.5-6.0	Very low-----	0.10	5	<1
Troup	50-72	15-35	1.40-1.60	0.6-2.0	0.10-0.13	4.5-5.5	Low----------	0.20		
TUE:										
Troup----------	0-60	2-12	1.30-1.70	6.0-20	0.08-0.12	4.5-6.0	Very low-----	0.10	5	<1
	60-72	15-35	1.40-1.60	0.6-2.0	0.10-0.13	4.5-5.5	Low----------	0.20		
Luverne---------	0-12	7-20	1.35-1.65	2.0-6.0	0.11-0.15	4.5-5.5	Low----------	0.24	4	.5-1
	12-28	35-50	1.25-1.55	0.2-0.6	0.12-0.18	3.6-5.5	Moderate-----	0.28		
	28-44	20-40	1.35-1.65	0.2-0.6	0.12-0.18	3.6-5.5	Low----------	0.28		
	44-60	10-35	1.35-1.65	0.2-0.6	0.05-0.10	3.6-5.5	Low----------	0.28		

TABLE 18.--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]

Map symbol and soil name	Hydrologic group	Flooding			High water table			Bedrock		Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Initial	Total	Uncoated steel	Concrete
					Ft			In		In	In		
ArE---------- Arundel	C	None------	---	---	>6.0	---	---	20-40	Soft	---	---	High-----	High.
BgA---------- Bigbee	A	Rare------	---	---	3.5-6.0	Apparent	Jan-Mar	>60	---	---	---	Low------	Moderate.
BnB, BnC---------- Blanton	A	None------	---	---	5.0-6.0	Perched	Dec-Mar	>60	---	---	---	High-----	High.
BoB, BoC---------- Bonifay	A	None------	---	---	4.0-5.0	Perched	Jan-Feb	>60	---	---	---	Low------	High.
CaA---------- Chrysler	C	Rare------	---	---	1.5-3.0	Apparent	Jan-Mar	>60	---	---	---	High-----	High.
CdB, CdC: Cowarts----------	C	None------	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
Dothan----------	B	None------	---	---	3.0-5.0	Perched	Jan-Apr	>60	---	---	---	Moderate	Moderate.
CuC: Cowarts----------	C	None------	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
Urban land.													
DaA---------- Dorovan	D	Occasional	Very long	Jan-Dec	+1-0.5	Apparent	Jan-Dec	>60	---	4-10	10-30	High-----	High.
DmA, DmB: Dothan----------	B	None------	---	---	3.0-5.0	Perched	Jan-Apr	>60	---	---	---	Moderate	Moderate.
Malbis----------	B	None------	---	---	2.5-4.0	Perched	Dec-Mar	>60	---	---	---	Moderate	Moderate.
DuC: Dothan----------	B	None------	---	---	3.0-5.0	Perched	Jan-Apr	>60	---	---	---	Moderate	Moderate.
Urban land.													
EsC---------- Esto	B	None------	---	---	>6.0	---	---	>60	---	---	---	High-----	High.
EuA---------- Eunola	C	Rare------	---	---	1.5-2.5	Apparent	Nov-Mar	>60	---	---	---	Low------	High.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Bedrock		Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Initial	Total	Uncoated steel	Concrete
					Ft			In		In	In		
FoA---------- Florala	C	None------	---	---	1.5-2.5	Apparent	Dec-Mar	>60	---	---	---	Moderate	High.
FuB---------- Fuquay	B	None------	---	---	4.0-6.0	Perched	Jan-Mar	>60	---	---	---	Low------	High.
GrA---------- Grady	D	None------	---	---	+3-+0.5	Apparent	Dec-Jun	>60	---	---	---	High-----	High.
IbA: Iuka----------	C	Frequent--	Very brief to brief.	Dec-Apr	1.0-3.0	Apparent	Dec-Apr	>60	---	---	---	Moderate	High.
Bibb----------	C	Frequent--	Brief-----	Dec-May	0.5-1.5	Apparent	Dec-Apr	>60	---	---	---	High-----	Moderate.
KaA---------- Kalmia	B	Rare------	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
LuB---------- Lucy	A	None------	---	---	>6.0	---	---	>60	---	---	---	Low------	High.
LyA---------- Lynchburg	C	None------	---	---	0.5-1.5	Apparent	Nov-Apr	>60	---	---	---	High-----	High.
MaA---------- Maxton	B	Rare------	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
MBA: Muckalee---------	D	Frequent--	Brief-----	Nov-Apr	0.5-1.5	Apparent	Dec-Mar	>60	---	---	---	High-----	Moderate.
Bibb----------	C	Frequent--	Brief-----	Dec-May	0.5-1.5	Apparent	Dec-Apr	>60	---	---	---	High-----	Moderate.
Osier----------	D	Frequent--	Brief-----	Dec-Apr	0-1.0	Apparent	Nov-Mar	>60	---	---	---	High-----	High.
OrA, OrB, OrC, OrE---------- Orangeburg	B	None------	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
OuC: Orangeburg-------	B	None------	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
Urban land.													
PIT: Pits.													
RaA---------- Rains	B/D	None------	---	---	0-1.0	Apparent	Nov-Apr	>60	---	---	---	High-----	High.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Bedrock		Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Initial	Total	Uncoated steel	Concrete
					Ft			In		In	In		
RbA:													
Rains	D	Frequent	Brief	Nov-Apr	0-1.0	Apparent	Nov-Apr	>60	---	---	---	High	High.
Bethera	D	Frequent	Brief to long.	Dec-Apr	0-1.5	Apparent	Dec-Apr	>60	---	---	---	High	High.
RdB Red Bay	B	None	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
SmE Smithdale	B	None	---	---	>6.0	---	---	>60	---	---	---	Low	Moderate.
TrB, TrD Troup	A	None	---	---	>6.0	---	---	>60	---	---	---	Low	Moderate.
TUE:													
Troup	A	None	---	---	>6.0	---	---	>60	---	---	---	Low	Moderate.
Luverne	C	None	---	---	>6.0	---	---	>60	---	---	---	High	High.

TABLE 19.--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				
Arundel: 1/					
S77AL-039-12	0-6	A	83.5	7.2	9.3
	6-14	Bt1	25.9	8.2	65.9
	14-21	Bt2	6.1	8.0	85.9
	21-30	Bt3	25.8	16.6	57.6
	30-60	Cr	5.1	10.4	84.5
Bibb: 1/ 2/					
S83AL-039-12	0-3	A	42.4	30.0	27.6
	4-11	A'	38.5	32.7	28.8
	11-20	Cg1	68.5	19.7	11.8
	20-38	Cg2	79.9	12.3	7.8
	38-65	Cg3	98.2	1.3	0.5
Blanton: 1/					
S77AL-039-13	0-6	A	84.3	11.7	4.0
	6-21	E1	81.0	15.1	3.9
	21-45	E2	84.5	12.7	2.8
	45-62	E3	88.8	6.9	4.3
	62-80	Bt	72.6	5.3	22.1
Cowarts: 1/					
S77AL-039-15	0-1	A1	85.7	6.5	7.8
	1-6	A2	84.8	10.1	5.1
	6-18	Bt1	58.5	5.4	36.1
	18-28	Bt2	62.1	6.7	31.2
	28-60	C	66.1	2.1	31.8
Eunola: 1/					
S77AL-039-8	0-5	Ap	80.0	11.3	8.7
	5-12	Bt1	71.9	6.2	21.9
	12-24	Bt2	68.8	7.9	23.3
	24-44	Bt3	60.5	16.7	22.8
	44-60	C	62.7	15.5	21.8
Florala: 1/					
S79AL-039-3	0-8	A	70.3	22.0	7.7
	8-22	Bt1	73.7	16.0	10.3
	22-36	Bt2	78.4	13.5	8.1
	36-72	Btv	59.9	23.3	16.8
Fuquay: 1/					
S77AL-039-10	0-7	Ap	88.1	8.1	3.8
	7-30	E	79.5	11.5	9.0
	30-37	Bt	75.4	7.4	17.2
	37-52	Btv1	68.9	5.1	26.0
	52-66	Btv2	71.8	4.0	24.2
Muckalee: 1/					
S78AL-039-5	0-10	A	57.2	29.6	13.2
	10-18	Cg1	53.9	27.9	18.2
	18-42	Cg2	77.3	13.1	9.6
	42-54	Cg3	75.5	13.8	10.7
	54-60	Cg4	73.6	11.7	14.7

See footnotes at end of table.

TABLE 19.--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				
Osier: 1/					
S83AL-039-14	0-14	A1	90.4	8.0	1.6
	14-19	A2	59.9	39.7	0.4
	19-30	Cg	95.7	4.2	0.1
	30-42	C1	92.1	6.6	1.2
	42-54	C2	97.1	1.7	1.2
	54-60	Cg'	96.7	1.7	1.6

1/ See "Soil Series and Their Morphology" for pedon location.

2/ The 3 to 4 inch depth, Oi horizon, in the Bibb soil, which is undecomposed hardwood leaves, twigs, and fine roots, was not analyzed.

TABLE 20.--CHEMICAL ANALYSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Extractable bases			Extractable acidity	Base saturation	Reaction	Cation-exchange capacity
			Ca	Mg	K				
	In		Meq/100g				Pct	pH	
Arundel: 1/									
S77AL-037-12	0-6	A	0.71	0.49	0.07	3.76	25.48	5.1	5.04
	6-14	Bt1	1.04	2.72	0.29	28.72	12.37	4.2	32.77
	14-21	Bt2	1.06	3.00	0.35	27.52	13.86	4.1	31.94
	21-30	Bt3	0.64	2.01	0.26	22.16	11.64	3.9	25.07
	30-60	Cr	0.74	2.43	0.37	31.84	10.01	3.1	35.38
Bibb: 1/									
S83AL-039-12	0-3	A	5.55	1.13	0.24	4.16	62.44	4.7	11.08
	4-11	A'	2.70	0.41	0.09	3.92	44.96	4.5	7.12
	11-20	Cg1	1.28	0.19	0.02	1.84	44.72	4.7	3.33
	20-38	Cg2	1.83	0.26	0.02	0.72	74.56	5.5	2.83
	38-65	Cg3	1.25	0.18	0.01	0.56	71.90	5.0	1.99
Blanton: 1/									
S77AL-039-13	0-6	A	0.20	0.06	0.05	1.44	18.02	5.2	1.75
	6-21	E1	0.18	0.09	0.03	0.64	32.56	5.2	0.94
	21-45	E2	0.20	0.09	0.02	0.56	36.27	5.3	0.87
	45-62	E3	0.20	0.13	0.02	0.48	42.28	5.3	0.83
	62-80	Bt	0.16	0.39	0.06	4.80	11.35	4.9	5.41
Cowarts: 1/									
S77AL-039-15	0-1	A1	1.02	0.22	0.09	5.76	18.89	4.3	7.10
	1-6	A2	0.24	0.06	0.02	2.24	12.70	5.1	2.56
	6-18	Bt1	0.18	0.09	0.01	3.04	8.67	4.7	3.32
	18-28	Bt2	0.22	0.16	0.01	4.16	8.65	4.8	4.55
	28-60	C	0.14	0.09	0.01	2.32	9.67	4.9	2.56
Eunola: 1/									
S77AL-039-8	0-5	Ap	2.78	1.67	0.10	2.88	61.26	5.9	7.43
	5-12	Bt1	0.20	0.19	0.02	3.20	11.53	4.5	3.61
	12-24	Bt2	0.12	0.06	0.01	2.08	8.60	5.0	2.27
	24-44	Bt3	0.20	0.13	0.03	4.00	8.29	4.7	4.36
	44-60	C	0.48	0.32	0.04	3.84	18.10	4.6	4.68
Florala: 1/									
S79AL-039-3	0-8	A	0.13	0.07	0.04	8.08	3.00	4.5	8.33
	8-22	Bt1	0.06	0.02	0.01	2.24	3.78	4.8	2.33
	22-36	Bt2	0.06	0.03	0.01	1.84	4.98	4.8	1.94
	36-72	Btv	0.05	0.03	0.01	2.72	2.87	5.4	2.80
Fuquay: 1/									
S77AL-039-10	0-7	Ap	1.42	0.09	0.05	0.80	66.23	5.6	2.36
	7-30	E	0.70	0.13	0.05	0.88	50.06	5.6	1.76
	30-37	Bt	0.48	0.16	0.09	2.80	20.81	4.6	3.53
	37-52	Btv1	0.66	0.22	0.06	3.60	20.89	5.1	4.55
	52-66	Btv2	0.16	0.13	0.03	2.80	10.30	5.0	3.12
Muckalee: 1/									
S78AL-039-5	0-10	A	4.65	0.64	0.16	4.88	52.77	4.8	10.33
	10-18	Cg1	4.33	0.53	0.04	2.64	64.96	5.7	7.53
	18-42	Cg2	1.95	0.28	0.01	0.88	71.82	6.0	3.12
	42-54	Cg3	2.43	0.33	0.02	0.72	79.44	6.3	3.50
	54-60	Cg4	2.78	0.41	0.03	0.88	78.51	6.3	4.10
Osier: 1/									
S83AL-039-14	0-14	A1	0.15	0.02	0.01	0.88	17.17	5.0	1.06
	14-19	A2	0.30	0.12	0.03	4.40	9.21	4.2	4.85
	19-30	Cg	0.18	0.03	0.01	0.56	26.81	4.9	0.77
	30-42	C1	0.18	0.03	0.01	1.60	11.77	5.3	1.81
	42-54	C2	0.20	0.04	0.01	2.08	10.45	4.3	2.32
	54-60	Cg'	0.15	0.02	0.00	0.64	21.44	4.7	0.81

1/ See "Soil Series and Their Morphology" for pedon location.

TABLE 21.--ENGINEERING INDEX TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name, report number, horizon, and depth (in inches)	Classification		Grain-size distribution						Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve--					Percentage smaller than .005 mm			Maximum dry density	Optimum moisture
	AASHTO	Unified	3/8 inch	No. 4	No. 10	No. 40	No. 200					
									Pct		Lb/ft^3	Pct
Arundel: 1/												
S77AL-039-12												
Bt1 - - - - 6-14	A-7-5(30)	MH	100	100	100	81	79.0	73.6	71	32	84.7	24.2
Bt3 - - - - 21-30	A-7-6(33)	CH	100	100	100	99	76.0	67.4	70	41	72.6	37.6
Blanton: 1/												
S77AL-039-13												
E2 - - - - 21-45	A-2-4(0)	SM	100	100	100	99	19.0	7.4	---	NP	107.4	11.7
Bt - - - - 62-80	A-2-4(0)	SM	100	100	100	99	28.0	23.6	---	NP	110.0	13.8
Cowarts: 1/												
S77AL-039-15												
A2 - - - - 1-6	A-2-4(0)	SM	100	99	99	85	18.0	8.6	---	NP	114.8	9.0
Bt1 - - - - 6-18	A-6(2)	SC	100	100	100	88	46.0	38.0	33	12	107.7	16.4
C - - - - 28-60	A-6(1)	SC	100	100	100	77	36.0	31.4	37	16	110.5	14.7
Eunola: 1/												
S77AL-039-8												
Ap - - - - 0-5	A-2-4(0)	SM	100	100	100	87	25.5	12.8	---	NP	106.2	14.8
Bt2 - - - - 12-24	A-4(0)	SM	100	100	100	93	37.5	24.4	29	4	111.7	15.0
C - - - - 44-60	A-6(3)	SC	100	100	100	96	46.0	29.6	29	11	115.9	13.6
Fuquay: 1/												
S77AL-039-10												
Ap - - - - 0-7	A-2-4(0)	SM	100	99	99	78	21.0	12.8	---	NP	125.7	7.8
Btv1 - - - - 37-52	A-2-4(0)	SM	100	100	100	72	32.0	28.0	32	8	114.7	13.1
Btv2 - - - - 52-66	A-2-7(0)	SM	100	100	99	50	28.0	24.2	45	14	114.9	13.9
Maxton: 1/												
S77AL-039-6												
E - - - - 5-15	A-2-4(0)	SM	100	100	100	85	29.0	11.4	---	NP	117.8	9.8
Bt - - - - 15-25	A-2-4(0)	SM-SC	100	100	100	83	35.0	25.6	29	7	116.0	12.9

1/ See "Soil Series and Their Morphology" for pedon location.

TABLE 22.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Arundel	Clayey, montmorillonitic, thermic Typic Hapludults
Bethera	Clayey, mixed, thermic Typic Paleaquults
Bibb	Coarse-loamy, siliceous, acid, thermic Typic Fluvaquents
Bigbee	Thermic, coated Typic Quartzipsamments
Blanton	Loamy, siliceous, thermic Grossarenic Paleudults
Bonifay	Loamy, siliceous, thermic Grossarenic Plinthic Paleudults
Chrysler	Clayey, mixed, thermic Aquic Paleudults
Cowarts	Fine-loamy, siliceous, thermic Typic Hapludults
Dorovan	Dysic, thermic Typic Medisaprists
Dothan	Fine-loamy, siliceous, thermic Plinthic Paleudults
Esto	Clayey, kaolinitic, thermic Typic Paleudults
Eunola	Fine-loamy, siliceous, thermic Aquic Hapludults
Florala	Coarse-loamy, siliceous, thermic Plinthaquic Paleudults
Fuquay	Loamy, siliceous, thermic Arenic Plinthic Paleudults
Grady	Clayey, kaolinitic, thermic Typic Paleaquults
Iuka	Coarse-loamy, siliceous, acid, thermic Aquic Udifluvents
Kalmia	Fine-loamy over sandy or sandy-skeletal, siliceous, thermic Typic Hapludults
Lucy	Loamy, siliceous, thermic Arenic Paleudults
Luverne	Clayey, mixed, thermic Typic Hapludults
Lynchburg	Fine-loamy, siliceous, thermic Aeric Paleaquults
Malbis	Fine-loamy, siliceous, thermic Plinthic Paleudults
Maxton	Fine-loamy over sandy or sandy-skeletal, siliceous, thermic Typic Hapludults
Muckalee	Coarse-loamy, siliceous, nonacid, thermic Typic Fluvaquents
Orangeburg	Fine-loamy, siliceous, thermic Typic Paleudults
Osier	Siliceous, thermic Typic Psammaquents
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Red Bay	Fine-loamy, siliceous, thermic Rhodic Paleudults
Smithdale	Fine-loamy, siliceous, thermic Typic Hapludults
Troup	Loamy, siliceous, thermic Grossarenic Paleudults

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