SOIL SURVEY OF

SANTA ROSA COUNTY, FLORIDA

United States Department of Agriculture
Soil Conservation Service
in cooperation with
University of Florida Institute of Food and Agricultural Sciences
Agricultural Experiment Stations and Soil Science Department
and Florida Department of Agriculture and Consumer Services

HOW TO USE

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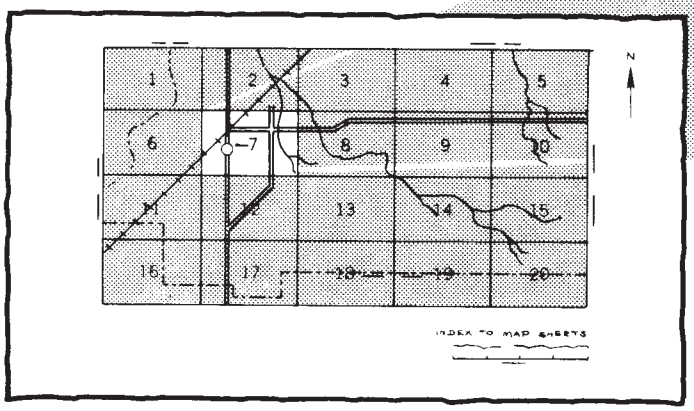

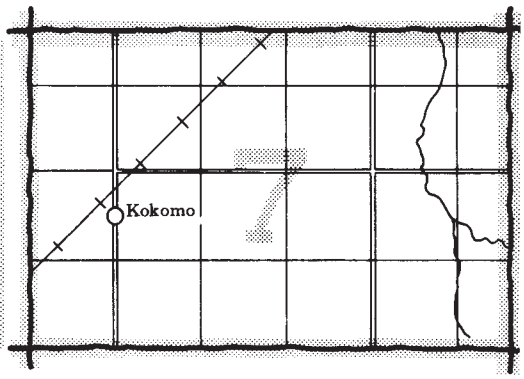

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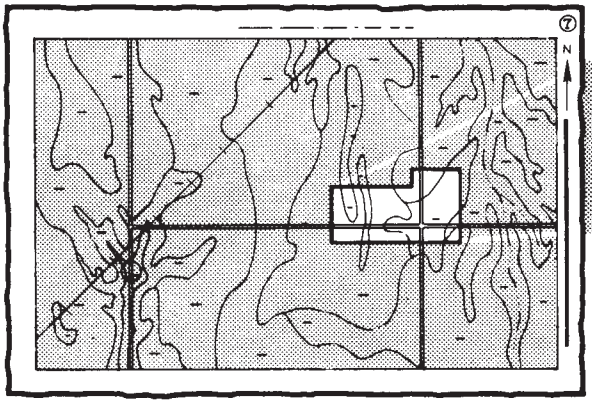

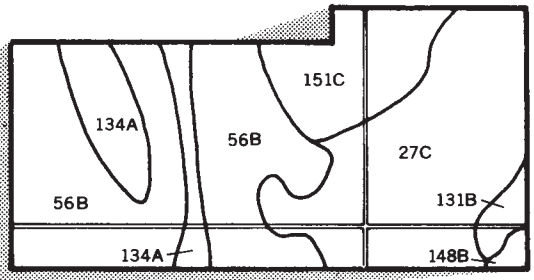

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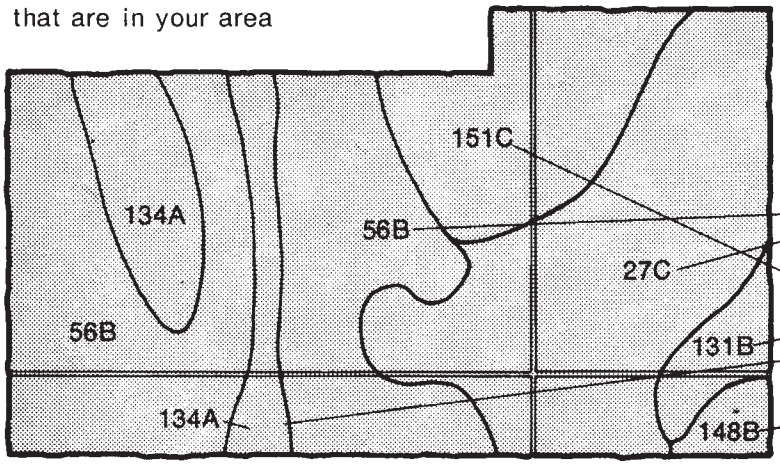

Symbols

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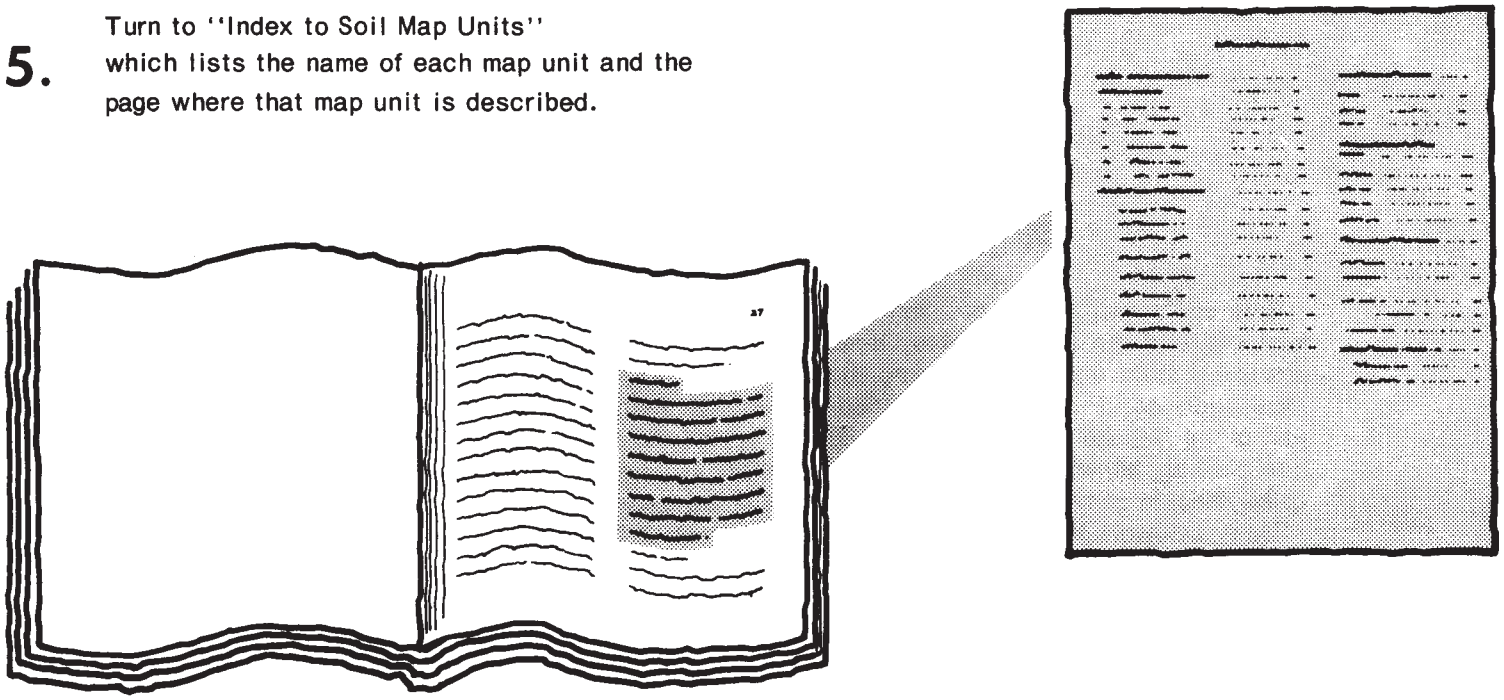
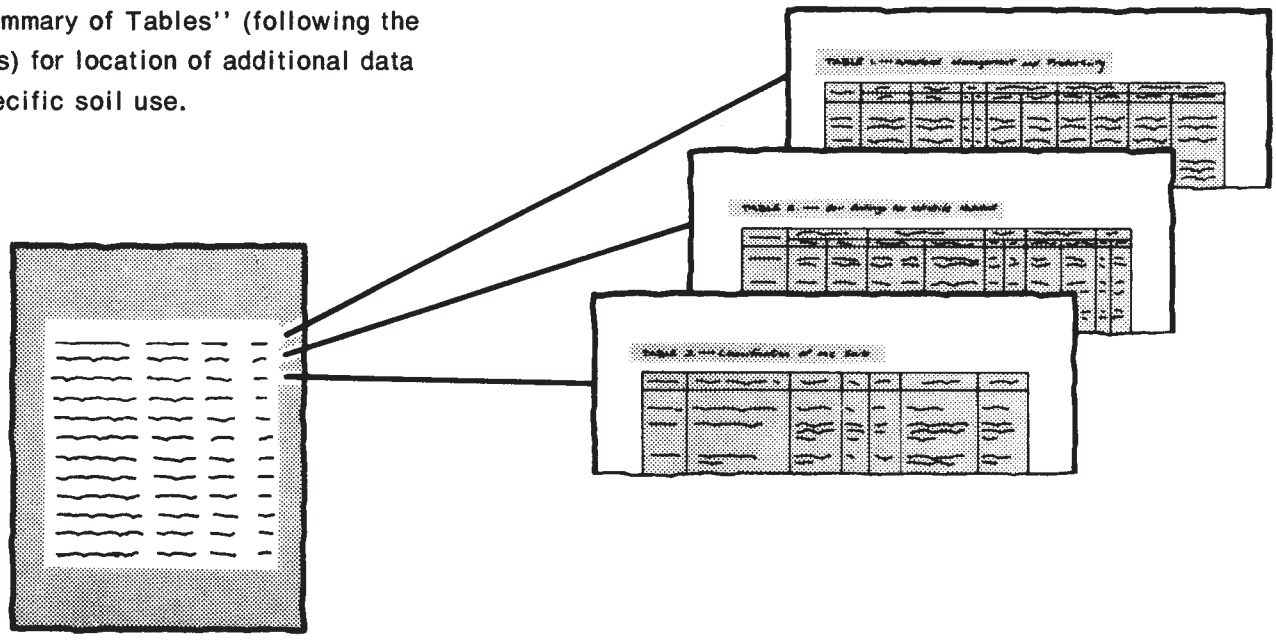
THIS SOIL SURVEY

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; for specialists in wildlife management, waste disposal, or pollution control.

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

Major fieldwork for this soil survey was performed in the period 1969-1977. Soil names and descriptions were approved in 1977. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1977. This survey was made cooperatively by the Soil Conservation Service; the University of Florida Institute of Food and Agricultural Sciences, Agricultural Experiment Stations and Soil Science Department; and the Florida Department of Agriculture and Consumer Services. It is part of the technical assistance furnished to the Blackwater Soil and Water Conservation District.

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

Cover: Soybeans on Class I land in Santa Rosa County. Soil is Orangeburg sandy loam, 0 to 2 percent slopes.

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Foreword

This soil survey contains information that can be used in land-planning programs in Santa Rosa 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.

William E. Austin
State Conservationist
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Location of Santa Rosa County in Florida.

SOIL SURVEY OF SANTA ROSA COUNTY, FLORIDA

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Willie L. Pittman, and George W. Allen

United States Department of Agriculture, Soil Conservation Service, in cooperation with
University of Florida Institute of Food and Agricultural Sciences, Agricultural Experiment Stations
and Soil Science Department and
Florida Department of Agriculture and Consumer Services

SANTA ROSA COUNTY is in northwestern Florida (see map on facing page). The county has a total area of 655,360 acres, or 1,024 square miles. About 1,250 acres of the county is small bodies of water. The county is about 45 miles across from north to south and 32 miles from east to west.

The county is in the Florida Panhandle portion of the Coastal Plain. The Escambia River, which forms the western boundary of the county, is the largest stream in the area. It flows through a deep gorge. South of the county is Santa Rosa Sound. A tributary of the Gulf of Mexico, the sound is separated from the Gulf by a narrow strip of land called Santa Rosa Island.

Elevation ranges from about 290 feet above sea level in the northern part of the county to sea level in the southern part (*6*). The topography is nearly level to gently sloping in the northwestern, southern, and central parts of the county. In the northeastern, eastern, and southeastern parts it is gently sloping to sloping.

The county is dissected by a number of large streams; Escambia River to the west, Pond Creek and Goldwater Creek near the center, and Juniper Creek, Blackwater River, Yellow River, and East River to the east. Most of these streams flow southward or southwestward. East River flows westward from Okaloosa County. The streams meander through Santa Rosa County, causing some streambank cutting.

Although Santa Rosa County is primarily rural and agricultural, the economy is based on industry and the military. In 1970, oil was discovered.

Milton, the county seat, has a population of 11,500. Other towns and communities are Allentown, Bagdad, Chumuckla, Gulf Breeze, Jay, Holley, Munson, Navarre, and Pace.

General nature of the county

This section gives general information about Santa Rosa County. Discussed are climate; physiography, relief and drainage; natural resources; history and development; and farming.

Climate

Condensed from U.S. Department of Commerce data; James T. Bradley, climatologist (*10, 11*).

Santa Rosa County has a warm humid-temperate climate. Summer has long, warm, humid days. Winter is mild and short. The Gulf of Mexico moderates high temperatures in summer and lows in winter along the coast; however, the Gulf's effect diminishes appreciably a few miles inland. The average annual temperature is 67 degrees F, and rainfall averages 65 inches a year.

Rainfall is the main form of precipitation. Forty-five percent of the rain falls during June, July, August, and September, although unusual amounts may fall during any month. The greatest amount of rain falls in July and September. October has the least rain. A large proportion of the rain falls during the afternoon and evening as thundershowers or showers. These showers, which occur on 40 percent of the days, are widely scattered, short, and often excessive. Sometimes 2 to 4 inches of rain falls within 1 or 2 hours.

Winter brings gentle rains of long duration, usually 1 to 3 days. Long-lasting showers in summer usually are associated with tropical disturbances. Rainfall of more than 8 inches during some 24-hour period can be expected in about 1 year in 8, usually when a hurricane passes through the area.

Snow is rare, and measurable snow occurs about 1 year in 10. Hailstorms are also infrequent and cover very restricted areas, so damage is restricted. Ground fog is usually confined to the night and early morning in late

fall, winter, and early spring. The sun usually dissipates the fog very quickly.

The Gulf of Mexico tempers the cold of winter, and causes cool sea breezes to move across the land on summer days. The average temperature in summer (June, July, August) is 80.1 degrees F. Cloudiness and associated thundershowers and showers relieve the heat and humidity. The average temperature in winter (December, January, February) is 54.3 degrees. The highest recorded temperature is 104 degrees and the lowest is 10 degrees.

Winter is mild but is punctuated by periodic invasions of cold air masses from the north. These cold periods last 1 to 3 days. The second day is usually the coldest because during the night, under clear skies, radiational cooling is accelerated and temperature plummets during the early morning. Unprotected water pipes may freeze. Table 1 gives data on temperature and precipitation for the survey area.

The average date of the last freezing temperature in spring is February 18, and the average date of the earliest freeze in autumn is December 15. The average growing season is 300 days. The earliest freezing temperature ever recorded in fall is October 27 and the latest in spring is April 10. Table 2 shows the expected dates for freezing temperatures in Santa Rosa County.

March is the windiest month, and August has the lowest average windspeed. Windspeed averages between 8 and 15 miles per hour during the day and usually drops below 8 miles per hour at night. The prevailing winds blow from the north and northwest during fall and winter and from the south and southwest in spring and summer. During summer a moderate sea breeze usually blows off the Gulf of Mexico, although the breeze diminishes greatly further inland. High winds of short duration occur occasionally in connection with thunderstorms in summer and with fronts moving across the county in other seasons. Tropical disturbances can generate very destructive winds up to 200 miles per hour. These seriously destructive hurricanes occur 1 year in 8.

Hurricanes, with high winds and accompanying rainfall, can destroy crops by wind damage and flooding. There is also a greater erosion potential when more than one-half inch of rain falls within an hour or two.

At the other extreme, there is an occasional short drought late in spring, when plants are beginning to grow and temperature is high. This moisture deficit can damage crops, pastures, and gardens, and can only be overcome by supplemental irrigation.

Physiography, relief, and drainage

Santa Rosa County lies in the Coastal Plain, a broad belt consisting primarily of unconsolidated sands, silts, and clay (*6*). The county can be divided into two physiographic divisions, the Western Highlands and the Gulf Coastal Lowlands (*4*).

The Western Highlands is a southwardly sloping plateau whose surface has been cut by numerous streams. Most of Santa Rosa County is in the Western Highlands. Some of the best land for farming and forest is in this area. Three principal streams—the Escambia, Blackwater, and Yellow Rivers—drain this area. The many smaller streams that feed these rivers have a trellis drainage pattern. Many of these streams commonly head in small steep-sided box canyons known as "steepheads." Steepheads form where undermining by springs create steep slopes at the head of smaller streams. The soils on the Western Highlands are predominantly well drained to excessively drained and are nearly level to gently rolling. Several faults in the northern part of the county form steep hills. The elevation of this area ranges from 100 to 290 feet above sea level.

The Gulf Coastal Lowlands is the low-lying area of southern Santa Rosa County. It consists of relatively undissected, nearly level plains. The highest terrace has an elevation of about 100 feet. At least 50 miles of shoreline scarps carved by the Penholoway sea are preserved along the valleys of the Escambia, Blackwater, Yellow, and East Bay Rivers. The largest unbroken terrace area in westernmost Florida is the peninsula that extends southward between the mouths of the Escambia and Yellow Rivers, separating Escambia Bay from East Bay. This area covers about 27 square miles. The low-lying area consists of flatwoods (fig. 1) and mixed hardwood swamps. The soils in the Gulf Coastal Lowlands are predominantly moderately well drained to very poorly drained and are nearly level. Elevation ranges from sea level to 30 feet above sea level.

Natural resources

Soil is one of the main natural resources in Santa Rosa County. More than half of the soils in the county are productive of the common crops and pasture grasses. The long growing season, favorable climate, and adequate water supply all help make this county good for farming.

Water is also a very important natural resource in Santa Rosa County. Most of the water for domestic and industrial uses comes from wells. There are many perennial streams throughout the county. Many of these streams offer a wide variety of recreational activities and also have high potential for industrial uses. On many farms that do not have adequate surface water, earthfill ponds have been constructed. Most of these ponds provide water for livestock and opportunities for boating and fishing.

Forestry and forest products are important in Santa Rosa County. Much of the county remains in woodland, which will continue to be one of the major natural resources.

Other natural resources of the county include oil, natural gas, sand, gravel, and soil material suitable for road

Figure 1.—Leon sand, 0 to 2 percent slopes, in the flatwoods. Typical vegetation on these poorly drained soils is sawpalmetto, pineland threeawn, gallberry, and scattered pine.

construction. The major oil producing area is in the northwestern part of the county.

The natural resources in Santa Rosa County can be developed in an orderly manner. Good management, proper use, and wise conservation are needed to preserve these resources for the future.

History and development

Don Tristan de Luna, the Spanish conquistador, explored what is now Santa Rosa County in 1559. In 1825 a trading post was established and was named Milton in honor of the family of John Milton, an early governor of Florida. At this early date the trading post was accessible by river and by stagecoach (*5*).

Santa Rosa County was originally covered by dense forest. Longleaf pine grew on the uplands, and mixed hardwoods grew on the bottom lands. The early settlers raised cattle, sheep, hogs, and poultry. Some of the crops grown were cotton, tobacco, sugarcane, cowpeas, velvetbeans, Irish potatoes, corn, peanuts, and fruits.

In the early days, the principal industries were at Bagdad on the Blackwater River. The Bagdad Land and Lumber Company began in 1828 and operated continu-

ously until 1929. The first cotton textile mill in the South was built near Milton.

Santa Rosa County was formed in 1842. Floridatown was the first county seat. The county seat was moved to Milton after an epidemic of yellow fever in 1842.

Industry has greatly changed since the early years of settlement. The major sources of income are agriculture, manufacturing, forestry, and military installations. Over half of the county is used for the production of forest products. Several major manufacturing companies have located here. Their products range from acrylic fibers and lingerie to fertilizer. Two government installations are also located in the county and are of great importance to the local economy: Whiting Field Naval Air Station, and Eglin Air Force Base. These installations train military personnel. The most recent industrial developments in the county are oil wells and refineries.

Medical facilities in Santa Rosa County are complete and modern. There are hospitals in Milton and in Jay. Other health services are provided by the County Health Department.

The county sponsors 22 schools with an enrollment of more than 10,000 students. A private school is also available for grades K-12. Pensacola Junior College has a center at Milton.

Santa Rosa County has good transportation facilities. Several county, State, and Federal highways provide efficient mobility within and through the county. Rail and bus transportation is available in the county, along with several truck lines. Commerical air service connections are available at Eglin Air Force Base and nearby Pensacola. Milton is on the Blackwater River, and a 9-foot channel provides access for barges. Deepwater port facilities are available at Pensacola, 22 miles from Milton.

Farming

Santa Rosa County is mainly a general farming area. The principal crops are soybeans, corn, peanuts, cotton, and small grains. Small acreages of truck crops and pecan groves are also grown. Most of the cropland is in the northwestern part of the county north of U. S. Highway 90. Livestock production also contributes to the farming industry of the county. Cattle, hogs, and poultry are the main livestock.

Approximately 90,000 acres, or 14 percent, of Santa Rosa County is in crops and pasture. About 19 percent of this is pasture. The main pasture grasses used for livestock grazing and hay are bahiagrass and Coastal bermudagrass.

Much of the cropland is subject to water and wind erosion. The soils in this county are some of the best in Florida for farming, but because of their susceptibility to erosion, conservation measures such as terraces, gully control structures, grassed waterways, and permanent vegetation are necessary for maximum protection.

The enactment of Soil Conservation District legislation in 1937 stirred the interest of many landowners in Santa Rosa County. The Blackwater Soil and Water Conservation District was organized on March 17, 1942. Its aim is to provide an organized plan for assisting farmers, land users, and public agencies with problems related to soil and water conservation.

The capability of many of the soils, the climate, and present economic conditions indicate that farming will continue to be important in Santa Rosa County.

How this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

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

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under "General soil map for broad land use planning" and "Soil maps for detailed planning."

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

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

engineers, planners, developers and builders, home buyers, and others.

General soil map for broad land use planning

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

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

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

Areas dominated by sandy, droughty soils

The two map units of this group consist mainly of excessively drained to moderately well drained, nearly level to strongly sloping soils that are sandy to a depth of 80 inches or more. Less extensive are well drained soils that have loamy material at a depth of 40 to 80 inches.

This group is in the southern and southeastern parts of Santa Rosa County.

1. Lakeland-Troup

Nearly level to strongly sloping soils; some are excessively drained and sandy throughout, and some are well drained and have at least 40 inches of sand over a loamy subsoil

This unit (fig. 2) is primarily in the southeastern part of Santa Rosa County. It consists of broad areas of rolling sandhills interspersed with long, narrow bottom lands surrounded by steep side slopes. The Troup soils are generally on side slopes in the sandhills and in broad areas in other parts of the county. The Lakeland soils generally are higher than the Troup soils but in some places are at the same elevation.

This map unit covers about 100,000 acres, or about 15 percent of the county. The map unit is about 75 percent Lakeland soils, 15 percent Troup soils, and 10 percent soils of minor extent.

Lakeland soils are nearly level to strongly sloping, deep, excessively drained, and droughty. They are sand more than 80 inches thick.

Troup soils are nearly level to gently sloping and are well drained. The soils are 40 to 80 inches of sand over sandy loam and sandy clay loam.

The minor soils in this unit are well drained Bonifay soils, moderately well drained to somewhat poorly drained Pactolus soils, and very poorly drained Rutlege soils.

Most of this unit remains in the native vegetation of scrub oak, wiregrass, and scattered pine. About 60 percent of this unit is on a military reservation (Eglin Air Force Base) and is used for troop training and seasonal hunting.

The soils in this unit have low potential for cultivated crops and pasture because of low available water capacity and steepness in some areas.

The soils in this unit are well suited to woodland and wildlife habitat. The Troup soils produce better timber than the Lakeland soils.

In most areas the soils are well suited to development of recreation sites and to urban uses. The potential for sanitary facilities is high except in areas of Pactolus and Rutlege soils.

2. Ortega-Kureb

Nearly level to gently sloping, moderately well drained and excessively drained soils that are sandy throughout

This unit is in the flatwoods in the southern part of Santa Rosa County between Santa Rosa Sound and East Bay. This unit is higher than the surrounding soils. Ortega soils are on the high ridges, and Kureb soils are at the higher elevations.

This unit covers about 15,000 acres, or about 2 percent of the county. This map unit is about 35 percent Ortega soils, 22 percent Kureb soils, and 43 percent soils of minor extent.

Ortega soils are moderately well drained. The surface layer is very dark gray sand about 4 inches thick. Below this to a depth of 80 inches or more is sand in various colors of brown and yellow. The water table is at a depth of 40 to 60 inches for most of the year. Below the permanent water table, the soil is generally leached pale brown to white. The water table may be above a depth of 40 inches during periods of heavy rainfall but generally not for more than 2 months.

Kureb soils are excessively drained and very droughty. The surface layer is sand that has a salt-and-pepper appearance. Below this is yellowish brown and pale brown sand to a depth of 80 inches or more. These soils have no high water table or drainage problem.

The minor soils in this unit are poorly drained Leon soils, very poorly drained Rutlege soils, somewhat poorly drained Pactolus soils, and excessively drained Lakeland soils.

Most of this unit is in live oak, scattered sand pine,

Figure 2.—Turkey oak and pine with sparse ground cover on Lakeland-Troup general soil map unit. Soil is Lakeland sand, 0 to 5 percent slopes.

and scrub oak. The ground cover is usually sparse on the Kureb soils and in most areas of the Ortega soils. Most of this unit is being developed for urban uses. A few thousand acres in the southwest corner of the county (the City of Gulf Breeze) is all urban.

The soils in this unit are poorly suited to cultivated crops and improved pasture. Droughtiness is the main limitation. Irrigation, liming, and frequent applications of fertilizer are needed for the best production.

The soils in this unit are poorly suited to campsites, paths and trails, and other recreational uses because of the sandy surface layer. The soils are generally well suited to urban development. The minor soils are limited by drainage.

Areas dominated by well drained soils that have a loamy subsoil

The four map units of this group consist mainly of well drained, nearly level to strongly sloping, highly dissected soils that have a loamy subsoil. Some of these soils have a loamy surface layer over a loamy subsoil, other soils have 20 to 40 inches of sand over a loamy subsoil, and a large area is soils that have 40 to 80 inches of sand over sandy clay loam.

This group lies north of Milton. The greatest area of the soils that have a thin sandy surface layer is in the northwestern part of the county.

3. Red Bay-Lucy

Nearly level to sloping, well drained, loamy and sandy soils that have a red or dark red, loamy subsoil

This map unit consists of cleared and cultivated farmland in the northwestern part of Santa Rosa County near Jay. A few thousand acres of this unit is near the center of the county around Allentown, where farming is also quite extensive. The areas are mostly large and the soils flat; the sloping soils are along the edges of the fields near sandy-bottomed creeks or streams.

This unit covers about 36,000 acres, or about 5 percent of the county. This unit is about 42 percent Red Bay soils, 33 percent Lucy soils, and 25 percent soils of minor extent.

Red Bay soils have a thin sandy surface layer less than 10 inches thick over a dark red and red loamy subsoil. These soils appear dusky red in fields.

Lucy soils have 20 to 40 inches of sand over a red loamy subsoil. These soils are more sandy than Red Bay soils and appear lighter in freshly cultivated fields.

The minor soils in this unit are well drained Dothan, Orangeburg, and Troup soils.

Most of this unit is used for cultivated crops. Nearly all of the acreage has been cleared and is farmed extensively. The soils of this unit have very few limitations for any use and generally need only simple management.

The soils in this unit have very few limitations for farming. This map unit comprises the prime farmland of Santa Rosa County.

The soils have high potential for woodland. Seedling mortality is very low. Available water capacity is optimum.

The soils in this unit are well suited to campsites, hiking trails, picnic areas, and other recreational uses. The potential for urban uses and dwellings is high. Sanitary facilities such as septic tank absorption fields work quite adequately throughout this unit.

Figure 3.—Pine and pineland threeawn on the steep Troup-Orangeburg-Dothan general soil map unit. Vegetation should be maintained on these areas to prevent erosion.

4. Troup-Orangeburg-Dothan

Sloping to strongly sloping, well drained, sandy and loamy soils that have a loamy subsoil

This map unit (fig. 3) consists of undulating sandy soils on sides of steep hills separated by long, narrow stream bottoms. These areas are mainly in the extreme western and northwestern parts of Santa Rosa County where the uplands drop to the terraces adjacent to the Escambia River bottom land. A small area is on rolling terrain in the north-central part of the county.

This unit covers about 26,500 acres, or about 4 percent of the county. This map unit is about 45 percent Troup soils, 10 percent Orangeburg soils, 10 percent Dothan soils, and 35 percent soils of minor extent.

Troup soils have a yellowish brown sand surface layer about 2 inches thick over 50 inches of loamy sand. The subsoil is red sandy loam and sandy clay loam to a depth of 80 inches or more. This soil is well drained and contains more sand than the other soils of the unit.

Orangeburg soils have a dark brown sandy loam surface layer about 6 inches thick. The subsoil is red sandy clay loam to a depth of 80 inches or more.

Dothan soils may have a perched water table during periods of heavy rainfall. The surface layer is very dark gray fine sandy loam about 7 inches thick. The subsoil is yellow and brownish yellow sandy loam and sandy clay loam to a depth of 80 inches or more. In places this soil contains as much as 15 percent reddish brown iron concretions between depths of 20 and 60 inches.

The minor soils in this unit are well drained Bonifay, Fuquay, and Lucy soils and the poorly drained Bibb soils.

Most of this unit is forested. The soils are highly erodible because slopes are as steep as 35 percent.

The soils in this unit are poorly suited to cultivated crops. Steepness and susceptibility to erosion are the main limitations. Terraces, grassed waterways, contour cropping, and rotations that include close-growing cover crops reduce erosion. The various pasture grasses help stabilize slopes and are well suited to these soils.

The soils in this unit are well suited to woodland. Trees help stabilize the slopes and keep the soil in place. Seedling mortality is low because moisture content is optimum.

The potential for urban development and recreational uses is low. Steepness and susceptibility to erosion are the main limitations.

5. Dothan-Orangeburg

Nearly level to sloping, well drained, loamy soils that have a loamy subsoil at a depth of less than 20 inches

This map unit (fig. 4) is scattered throughout Santa Rosa County north of U. S. Highway 90. Most of the unit is in the north-central part of the county. The soils are undulating.

This unit covers about 108,700 acres, or about 17 percent of the county. This unit is about 35 percent Dothan soils, 15 percent Orangeburg soils, and 50 percent soils of minor extent.

Dothan soils have a fine sandy loam surface layer less than 20 inches thick over a yellow, loamy subsoil. During periods of heavy rainfall, these soils may have a perched water table over a restricting layer of firm and brittle plinthite nodules.

Orangeburg soils have a red loamy subsoil at a depth of less than 20 inches. These soils are dryer than Dothan soils.

The minor soils in this unit are well drained Bonifay, Esto, Fuquay, Lucy, Tifton, and Troup soils; somewhat poorly drained Escambia and Lynchburg soils; and poorly drained Rains soils.

Most of this unit is in forest of longleaf and splash pine. Several thousand acres in the western part of the county is used for row crops and pasture. The wetter minor soils are used mainly for pasture. The soils in this unit are well suited to most uses; limitations are few. Some of the minor soils are limited by wetness.

The soils in this unit have high potential for crops and pasture. Row crops and pasture grow well on these soils. Good management and terraces constructed where slope is a limitation reduce erosion on land cleared for farming. Under such management, these soils are highly productive.

The soils in this unit are well suited to woodland, wildlife habitat, and recreation. Wetness is a concern in areas of minor soils. The major soils are highly erodible where slope is more than 5 percent.

The potential for urban development is high. The potential for sanitary facilities is moderate; absorption fields should be enlarged to compensate for the slower movement of effluent through these soils.

6. Troup-Dothan-Bonifay

Gently sloping to strongly sloping, well drained soils; some have 40 inches of sand over a loamy subsoil, and some are sandy or loamy and have a loamy subsoil at a shallow depth

This map unit is north of Milton. This unit is higher than the surrounding soils. The soils are mainly undulating. The Troup soils are generally higher than the other soils in this unit.

This map unit covers about 179,000 acres, or about 27 percent of the county. This unit is about 53 percent Troup soils, 15 percent Dothan soils, 12 percent Bonifay soils, and 20 percent soils of minor extent.

Troup soils have a thick, sandy surface layer. Loamy red material is at a depth of 40 to 80 inches.

Dothan soils have a loamy surface layer less than 20 inches thick. They have a yellow, loamy subsoil that contains firm, brittle plinthite nodules. In places, these

nodules form a layer that restricts the flow of water.

Bonifay soils have a thick, sandy surface layer. The subsoil is yellow and is generally at a depth of 40 to 65 inches.

The minor soils in this unit are well drained Fuquay and Lucy soils and excessively drained Lakeland soils.

This unit is mainly forested. Some of the area in the southwestern part of the county are used for urban development. Being spread throughout the county, the soils are used for a variety of purposes. A few areas are farmed.

The soils in this unit have low potential for crops because of droughtiness and rapid leaching of plant nutrients. Special management is also necessary in sloping areas because of the hazard of erosion. Terraces help to prevent erosion and gullying.

These soils are moderately suited to pasture. Grasses such as bahiagrass and Coastal bermudagrass are well suited to these soils. Liming and extensive fertilizing are necessary for good production and good ground cover.

The soils in this unit have high potential for wildlife habitat and for campsites and other recreational uses.

The potential for urban development is high. Septic tank absorption fields work well in these soils but need to be lengthened in the Dothan soils. Slope is the main limitation.

Areas dominated by somewhat poorly drained to very poorly drained, sandy and loamy soils

This group consist of somewhat poorly drained to very poorly drained, level sandy soils. Some of these soils have loamy horizons below a depth of 20 inches. All of the soils in this unit have sand at a depth of 60 inches or more.

South of Milton and U. S. Highway 90, in the flatwoods, this group is predominant.

7. Pactolus-Rutlege-Mulat

Level to gently sloping, somewhat poorly drained to very poorly drained soils that are sandy and loamy throughout

Figure 4.—Soybeans planted on the contour to control erosion. Soil is Dothan fine sandy loam, 2 to 5 percent slopes, in Dothan-Orangeburg general soil map unit.

This map unit consists of broad, flat areas of soils that are normally wet during most years. This unit is in the southern part of the county and along the southernmost strip of land between East Bay and Santa Rosa Sound. A few small areas extend to the central part of the county, where this unit is lower than the surrounding soils. Pactolus soils are higher than the other soils in this unit.

This unit covers about 60,000 acres, or 9 percent of the county. This unit is about 25 percent Pactolus soils, 20 percent Rutlege soils, 10 percent Mulat soils, and 45 percent soils of minor extent.

Pactolus soils are somewhat poorly drained. They are sandy to a depth of 80 inches or more. The water table fluctuates in this soil but generally is stable at a depth of about 30 inches during most of the year.

Rutlege soils are very poorly drained, sandy soils. They have a thick, dark surface layer 10 to 24 inches thick. These soils have water at or near the surface for most of the year. Ponding is quite common.

Mulat soils are poorly drained, sandy and loamy soils. The surface layer is dark and is usually less than 10 inches thick. Between depths of 20 and 60 inches is a layer of sandy clay loam or sandy loam. The water table is above a depth of 10 inches for 6 to 8 months in most years and is above the surface during periods of heavy rainfall.

The minor soils in this unit are somewhat poorly drained Albany, Garcon, Johns, and Lynchburg soils; poorly drained Leon soils; very poorly drained Dorovan, Pamlico, and Pickney soils; and moderately well drained Ortega soils.

The soils in this unit are in natural vegetation and are mostly idle. Natural vegetation on the Rutlege and Mulat soils is pitcher plant bogs. Areas of this unit are mainly used for pasture.

The soils in this unit are moderately well suited to the commonly grown grasses such as Pensacola bahiagrass and Coastal bermudagrass. These grasses grow well if properly managed. Controlled grazing helps maintain good ground cover and vigorous plant growth. Regular applications of lime and fertilizer are also needed. Drainage is required in places to remove surface water from the minor soils that are wet for long periods.

The soils in this unit have medium potential for woodland. Slash and longleaf pine grow well. Simple drainage and removal of surface water are necessary on the wetter soils. Seedling mortality is moderate. Good management insures high production.

These soils have medium to low potential for recreational facilities and shallow excavations because of wetness. The Pactolus soils and a few of the minor soils have high potential for septic tank absorption fields; the shallowness of the water table is the only limitation.

Areas dominated by soils subject to flooding

The four map units of this group consist of level, very poorly drained soils that generally have water at or above the surface most of the year. Some of these soils are sandy and mucky at the surface; the muck may extend to a depth of more than 5 feet. Other soils in this group have a high sulfur content and a high content of organic matter in the upper 3 or 4 feet and are underlain by sand or clay. Included in this group is a large area of well drained, somewhat poorly drained and poorly drained soils on the alluvial flood plain. These soils are loamy throughout or have a clayey subsoil. Some are underlain by sand.

This group is mostly adjacent to the major streams and rivers throughout the county.

8. Bibb-Kinston-Johns

Level soils; some are poorly drained and are stratified loamy and sandy material, and some are somewhat poorly drained and loamy

This map unit is in swamps and on flood plains and stream terraces throughout most of Santa Rosa County except the southern and southeastern parts. This unit is lower than the surrounding soils. The areas are generally long and narrow and are commonly surrounded by steep slopes or abrupt drop-offs from the uplands. The soils are sometimes flooded. The Bibb and Kinston soils are at the lower elevations on the flood plain, and the Johns soils are on the first stream terrace adjacent to the bottom land.

This unit covers about 80,000 acres, or about 12 percent of the county. This unit is about 40 percent Bibb soils, 20 percent Kinston soils, 7 percent Johns soils, and 33 percent soils of minor extent.

Bibb soils are poorly drained. They are stratified sandy and loamy material throughout. The loamy material is sandy loam, fine sandy loam, or silt loam. Some strata are gravel and gravelly loam. Since these soils are generally on flood plains, the thickness of the loamy and sandy layers varies considerably.

The Kinston soils are poorly drained. The surface layer is very dark gray silt loam about 9 inches thick. The subsoil is gray loam, clay loam, sandy clay loam, or silty clay loam. The water table is above a depth of 10 inches during periods of heavy rainfall.

Johns soils are mostly somewhat poorly drained, but in some areas close to the uplands they are high enough that they are moderately well drained. These soils are sandy loam and sandy clay loam in the upper 40 inches. Below this is sand that is generally saturated with water. The water table fluctuates in this soil; depth to the water table depends on rainfall but is less than 18 inches for 2 to 6 months each year.

The minor soils in this unit are somewhat poorly drained Albany, Lynchburg, and Pactolus soils and poorly drained Rains soils.

Most of this unit has not been cleared; therefore, extensive and costly land alteration would be needed for use. Potential of the soils varies considerably. This unit is extremely wet except in a few areas of minor soils.

The soils in this unit have medium potential for good pasture if the areas are cleared and water is controlled. Surface water can be removed by surface drainage ditches.

The soils in this unit have medium potential for woodland. Seedling mortality is moderate to low, depending on rainfall.

The soils in this unit provide good habitat for wildlife. The canopy offered by the mixed hardwoods and pine provides good shelter.

The potential for recreational development is low because of wetness. Wetness and flooding limit the use of these soils for urban development and for sanitary facilities such as septic tanks and sanitary landfills.

9. Dorovan-Pamlico

Nearly level, very poorly drained, organic soils that are underlain by sandy material

This map unit (fig. 5) is mainly in the southern part of Santa Rosa County. It consists of heavily vegetated swamps in wet depressional areas adjacent to the alluvial flood plains. Dorovan soils are mainly toward the center of the areas, and Pamlico soils are mainly closer to the outer edges.

This unit covers about 16,500 acres, or about 3 percent of the county. This unit is about 50 percent Dorovan soils, 30 percent Pamlico soils, and 20 percent soils of minor extent.

Dorovan soils are muck at least 51 inches thick over sandy material.

Pamlico soils are 16 to 51 inches of muck over sand, which extends to a depth of more than 80 inches.

The minor soils in this unit are poorly drained Bibb and Leon soils, somewhat poorly drained Pactolus soils, and very poorly drained Pickney and Rutlege soils.

All of the acreage of this unit is swampy and undrained. Native vegetation is titi, scattered longleaf pine, and mixed hardwoods. Wetness limits these soils for farming and for most other uses.

The soils in this unit are not suited to cultivated crops or pasture because of flooding and a constantly high water table. Also, clearing the land is not always feasible. Drainage is difficult because no outlets are available. A well designed and well maintained water control system keeps the water at a proper depth for special crops and reduces the hazard of subsidence resulting from oxidation of organic matter if the soils are cleared.

The potential for woodland is very low. Seedling mortality is very high because of the constantly high water table.

The soils in this unit have very low potential for urban uses because of the thick layers of organic material and the high water table. There are no reasonable and practical measures to overcome the severe wetness.

10. Bohicket

Level, very poorly drained, clayey soils that are underlain by sandy and loamy materials

This map unit consists of low lying, wet soils in salt marshes. These soils are along the coast and the mouth of major rivers and streams in the southern part of Santa Rosa County. The areas are thoroughly dissected by numerous small bayous and streams.

This unit covers about 8,500 acres, or about 1 percent of the county. This unit is about 80 percent Bohicket soils, about 15 percent Handsboro soils, and about 5 percent soils of minor extent.

Bohicket soils are very poorly drained and are frequently flooded by tides. The surface layer is clay and silty clay. The sandy subsoil is at a depth of 40 inches or more. These soils are very soft and compressible when wet. The surface layer has a moderate amount of organic matter from decomposition of prominent plants. These soils have a high content of sulfur.

Handsboro soils are also very poorly drained. They typically have a black muck surface layer matted with roots; it is about 20 inches thick. The next 20 inches is very dark gray stratified clay and muck. The next 24 inches is very dark gray muck. Below this is dark olive gray silty clay to a depth of 80 inches or more.

The minor soils in this unit are similar to the Bohicket and Handsboro soils but have a silty clay loam or silty clay surface layer.

This unit is entirely salt marshes that are saturated with tidal waters. Only salt-tolerant plants can survive. The native vegetation is mainly cordgrasses and needlerushes and a variety of other salt-tolerant plants, which are the only plants that can survive on these soils.

The soils in this unit are poorly suited to crops or pasture because of wetness and salt content.

These soils are not suited to woodland. They have no trees except a few cypress and bay along the edges of the marsh where wave action has built up a considerable amount of sand.

The potential for wetland wildlife habitat is low. The vegetation provides shelter for wildlife. This map unit is better suited to wildlife habitat than to other uses.

These soils have very low potential for urban development and for sanitary facilities because of the frequent flooding. There are no practical and reasonable measures to overcome the flooding.

11. Chewacla-Wahee-Riverview

Level, somewhat poorly drained and well drained, loamy soils

This map unit (fig. 6) consists of alluvial swamps. They

Figure 5.—Titi and bay on the Dorovan-Pamlico general soil map unit. These organic soils are usually left in their natural state because draining and removing organic matter is very difficult.

are lower than the surrounding soils. This unit is along the western boundary of Santa Rosa County. This unit has a network of sloughs and old river beds that have been cut off from the main channel. The numerous lakes

are almost always filled with water. Chewacla and Wahee soils are at the lower elevations on the flood plain, and the Riverview soils are at the higher elevations.

This unit covers about 25,160 acres, or about 4 percent of the county. This unit is about 35 percent Chewacla soils, 35 percent Wahee soils, 20 percent Riverview soils, and 10 percent soils of minor extent.

Chewacla soils are somewhat poorly drained. The surface layer is dark brown silt loam about 7 inches thick. The subsoil is mottled silty clay loam to a depth of 50 inches. Below this is light gray sand to a depth of 63 inches.

Wahee soils are somewhat poorly drained. The surface layer is brown clay loam about 3 inches thick. The subsoil is mottled clay and clay loam to a depth of 65 inches or more. This soil has a high water table that varies between depths of 12 and 30 inches.

Riverview soils are well drained. The surface layer is typically silt loam about 4 inches thick. The subsoil is silty clay loam and sandy clay loam to a depth of about 30 inches. Below this is fine sandy loam and sand to a depth of more than 65 inches. These soils may be flooded almost as frequently as the other soils in the unit, but they have a deeper permanent water table.

The minor soils in this unit are poorly drained Bibb and Kinston soils.

The soils in this unit remain in the natural vegetation of mixed hardwoods and a few scattered pine. None of the unit is used for crops.

The soils in this unit are poorly suited to cultivated crops and pasture. Flooding by stream overflow is the major limitation. Soils in the lower areas are also limited by poor drainage. However, with proper water control and good management, a few of the better drained soils at higher elevations are moderately suited to special crops and good quality pasture. The cost of clearing the dense vegetation and providing adequate drainage and adequate flood control, including dikes and levees, usually prohibits these uses.

Figure 6.—River bottom hardwoods on the Chewacla-Wahee-Riverview association. These soils are flooded during heavy rains.

The soils in this unit have low potential for producing pine.

The potential for sanitary facilities and dwellings is very low. There are no practical measures to overcome the wetness.

The potential for shallow excavations, playgrounds, and local roads and streets is low because of the wetness and flooding. Water control, mounding, filling, and flood control help to overcome the limitations.

Soil maps for detailed planning

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, a brief description of the soil profile, and a listing of the principal hazards and limitations to be considered in planning management.

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, Fuquay loamy sand, 0 to 5 percent slopes, is one of several phases in the Fuquay 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. Troup-Orangeburg-Cowarts complex, 5 to 12 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. Bibb-Kinston 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. Bohicket and Handsboro soils is an undifferentiated group in this survey area.

Not all of the map units in this county have been mapped with the same degree of detail. Broadly defined units, indicated by a superscript on the soil map legend, are apt to be larger and to vary more in composition than the rest of the map units in the survey. Composition of these broadly defined units has been controlled well enough, however, to be interpreted for the expected use of the soils.

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

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

Each map unit is rated for its *potential* for certain uses. The potential of a soil is the ability of that soil to produce, yield, or support the given structure or activity at some economic, social, or environmental cost. The criteria used for rating soil potential include the relative difficulty or cost of overcoming soil limitations, limitations that remain after generally used practices are installed, and the suitability of the soil relative to other soils in the area.

A five-class system of soil potential is used. The classes are defined as follows:

Very high potential. Soil limitations are minor or are relatively easy to overcome. Performance for the intended use is excellent. Soils having very high potential are the best in the survey area for the particular use.

High potential. Some soil limitations exist, but practices necessary to overcome the limitations can be installed at reasonable cost. Performance for the intended use is good.

Medium potential. Soil limitations exist and can be overcome with recommended practices; limitations, however, are mostly of a continuing nature and require prac-

tices that are more difficult or costly than average. Performance for the intended use ranges from fair to good.

Low potential. Serious soil limitations exist, and they are difficult to overcome. Practices necessary to overcome the limitations are relatively costly compared to those required for soils of higher potential. Necessary practices can involve environmental values and considerations. Performance for the intended use is poor or unreliable.

Very low potential. Very serious soil limitations exist, and they are most difficult to overcome. The initial cost of practices and the cost of maintenance are very high compared to those of soils with high potential. Environmental values are usually depreciated. Performance for the intended use is inadequate or below acceptable standards.

Table 3 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.

1—Albany loamy sand, 0 to 5 percent slopes. This somewhat poorly drained, nearly level to gently sloping soil is on low upland ridges. Slopes are smooth to concave. Areas of this soil range mostly from 10 to 50 acres in size, but some areas are as small as 5 acres.

Typically, the surface layer is very dark gray loamy sand about 5 inches thick. The subsurface layer is loamy sand. The upper 12 inches of the subsurface layer is brown; the next 8 inches is light olive brown with brownish gray, yellowish brown, and pale brown mottles; and the lower 22 inches is yellowish brown with strong brown mottles. The upper 5 inches of the subsoil is yellowish brown sandy loam with strong brown and light brownish gray mottles; the next 15 inches is mottled light gray, yellowish brown, brownish yellow, pale brown, strong brown, light reddish brown, and red sandy loam; and the lower 13 inches is mottled yellowish brown, brownish yellow, white, strong brown, red, and pale red sandy loam.

Included with this soil in mapping are small areas of Bonifay, Fuquay, Lakeland, Pactolus, and Troup soils. Also included are a very few small areas where slopes are 5 to 8 percent and a few small areas of soils that are similar to Albany soils but that have a sand surface layer. Inclusions make up less than 15 percent of any mapped area.

In this Albany soil the water table is at a depth of 12 to 30 inches for 1 to 4 months during most years. Available water capacity is moderately low to low, and natural fertility is low. Permeability is rapid in the sandy layers and moderate in the subsoil. Runoff is slow, and the erosion hazard is slight.

The natural vegetation consists of longleaf and slash pine and various oaks. The understory is mainly gallberry, waxmyrtle, and pineland threeawn.

Most areas of this soil remain in woodland. A few small areas have been cleared and used for crops.

If properly managed, this soil is moderately suited to crops. Good water control is needed. Cultivated crops should be planted on the contour in rotation with close-growing, soil-improving crops. All crop residue should be left in the field and incorporated into the soil. This soil responds well to fertilizer and lime.

This soil is moderately suited to pasture grasses. Bahiagrass and Coastal bermudagrass are moderately suited for pasture and hay. They grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has medium potential for loblolly and slash pine under a high level of management. Equipment limitations, seedling mortality, and plant competition are moderate.

This soil has high potential for local roads and streets. It has medium potential for septic tank absorption fields, dwellings without basements, low commercial buildings, shallow excavations, trench sanitary landfills, and playgrounds. Water control, mounding, or filling may be needed for these uses.

This soil is in capability subclass IIIe.

2—Angie Variant loam. This moderately well drained, nearly level soil is primarily on broad flats between streams and along drainageways. Slopes are smooth to concave. Areas of this soil range in size from 10 to 60 acres.

Typically, the surface layer is very dark gray loam about 4 inches thick. The upper 3 inches of the subsoil is light olive brown loam; the next 4 inches is brownish yellow clay loam; the next 14 inches is brownish yellow clay; the next 14 inches is mottled brownish yellow, gray, pale brown, strong brown and red sandy clay loam; the next 13 inches is gray clay with mottles of strong brown, red, and brownish yellow, and the lower 24 inches is light gray clay with mottles of red, strong brown, and brownish yellow.

Included with this soil in mapping are small areas of Escambia, Johns, and Lynchburg soils. Also included are areas where slopes are 2 to 5 percent, areas of poorly drained soils in and along narrow stream bottoms and drainageways, and areas of soils that are similar to Angie Variant soils but that have a loamy sand, loamy fine sand, or fine sandy loam surface layer. Inclusions make up about 15 percent of any mapped area.

In this Angie Variant soil the water table is between depths of 30 to 50 inches for more than 6 months. During dry periods, the water table will drop below a depth of 60 inches for as long as 1 month. Permeability is moderate to moderately slow above a depth of 7 inches and slow or very slow below this depth. The slow permeability causes water to stand on the surface during periods of excessive rainfall. Available water capacity

and organic matter content are moderate. Natural fertility is low. Internal drainage under natural conditions is slow.

The natural vegetation is second growth slash and longleaf pine and various hardwoods and shrubs. The understory consists of gallberry, waxmyrtle, and pineland threeawn.

Most areas of this soil remain in natural vegetation.

This soil is moderately suited to cultivated crops. The choice of crops is somewhat limited by occasional wetness caused by the high water table and slow permeability. Crops such as corn, soybeans, and small grains are easily grown under proper management. Ditches are the most effective way to remove excess water. Crop rotations should include cover crops at least half of the time. Crop residue and cover crops should be left on the ground. Maximum yields require good seedbed preparation, fertilizing, and liming at the correct time.

This soil is well suited to adapted pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well when properly managed. Fertilizing, liming, and control of grazing are required to maintain vigorous plants for best production.

This soil has high potential for slash pine and longleaf pine. Equipment limitations are moderate. Planting and harvesting during dry periods overcomes the limitation.

This soil has high potential for trench sanitary landfills, dwellings without basements, low commercial buildings, and shallow excavations. It has medium potential for septic tank absorption fields, local roads and streets, and playgrounds. Water control, mounding, and filling may overcome the limitations for these uses. The size of filter fields should be increased. Suitable fill is needed to increase soil strength for roads and streets.

This soil is in capability subclass IIw.

3—Bibb-Kinston association. These poorly drained, nearly level soils are in drainageways and on flood plains along streams. Slopes range from 0 to 2 percent. The areas are interspersed with depressions, old stream channels, and meandering sloughs. Bibb and Kinston soils occur in a regular and repeating pattern. The Bibb soil is near the stream edge, and the Kinston soil is in the wider areas generally back from the stream edge. The areas of each soil are large enough to map separately, ranging from about 10 to 160 acres. Mapped areas of this association are generally long and narrow and range from about 40 acres to more than 400 acres in size.

This association is about 50 percent Bibb soil, 25 percent Kinston soil, and 25 percent minor soils.

Typically, the Bibb soil has a surface layer of very dark gray silt loam about 6 inches thick. The subsurface layer is dark gray silt loam about 11 inches thick. The underlying material extends to a depth of 65 inches; the upper 25 inches is gray silt loam that has yellowish brown mottles, the next 18 inches is light brownish gray fine sand that has a few thin streaks of silt loam and loamy fine sand, and the lower 25 inches is light brownish gray fine sand that has light gray and light yellowish brown mottles.

In the Bibb soil the water table is at a depth of less than 10 inches for 6 months or more during most years. This soil is also subject to frequent flooding. Permeability is moderate, and available water capacity is medium. Natural fertility is moderate.

Typically, the Kinston soil has a surface layer of very dark gray silt loam about 9 inches thick. The subsoil is 41 inches thick; the upper 9 inches is dark gray silt loam that has very dark gray and gray mottles, the next 23 inches is gray sandy clay loam that has dark gray and brownish yellow mottles, and the lower 9 inches is light brownish gray sandy clay loam that has gray mottles. The underlying material extends to a depth of 65 inches; the upper 10 inches is dark gray sand with pockets of sandy loam and loamy sand, and the lower 5 inches is brown sand.

In the Kinston soil the water table is at a depth of less than 10 inches for 6 months or more during most years. This soil is subject to frequent flooding. Permeability is moderate, and available water capacity is medium to high. Natural fertility is moderate.

The most common minor soils are Escambia, Johns, Pactolus, Pamlico, and Rutlege soils. Most of these soils are poorly drained to very poorly drained and are in small areas through the association. In a few of the higher areas on low knolls and along the edge of mapped areas, the soils are moderately well drained to somewhat poorly drained; these are the least extensive of the minor soils mapped in this association. Also included in mapping are small areas of soils that are similar to Bibb and Kinston soils but in which the subsoil is not as gray.

The natural vegetation is gum, bay, cypress, juniper, oak, and a few scattered longleaf pine. The dense understory consists of titi, waxmyrtle, ferns, and other water-tolerant shrubs.

All areas of this association remain in natural vegetation.

Under natural conditions these soils are not suited to cultivated crops and are poorly suited to improved pasture. Flooding and wetness are the major limiting factors. The high cost of clearing the dense vegetation also limits use. However, with proper water control and good management, these soils have high potential for good quality pasture.

These soils have high potential for loblolly pine, yellow-poplar, and sweetgum, but water control is necessary. Plant competiton is severe. Equipment limitations and seedling mortality are severe because of flooding and wetness.

These soils have very low potential for septic tank absorption fields, dwellings without basements, low commercial buildings, and trench sanitary landfills. They have low potential for shallow excavations, playgrounds, and

local roads and streets. Mounding, water control, filling, and control of flooding may overcome the limitations for these uses.

This association is in capability subclass Vw.

4—Bohicket and Handsboro soils. These very poorly drained soils are in tidal marshes at the mouth of major streams and rivers. They are flooded daily by tidal water. Slopes range from 0 to 0.5 percent. Mapped areas of this group range from 25 to 2,000 acres in size. The smaller areas generally are small islands.

The Bohicket soil makes up 70 to 100 percent of each mapped area. The Handsboro soil occurs in most areas. At the mouth of the Escambia River, it makes up as much as 30 percent of the group.

Typically, the Bohicket soil has a surface layer of very dark grayish brown clay about 15 inches thick. The upper part of the underlying material is dark olive gray silty clay to a depth of 45 inches, and the lower part is gray sand with lenses of sandy loam; it extends to a depth of more than 80 inches.

In the Bohicket soil, permeability is very slow. Organic matter content is 15 to 20 percent, which makes the natural fertility very high.

Typically, the Handsboro soil has a surface layer of black muck matted with roots; it is 20 inches thick. Below this is a layer of stratified very dark gray clay and muck; this layer is 20 inches thick. The next layer is very dark gray muck to a depth of about 64 inches. The underlying material is dark olive gray silty clay to a depth of 80 inches or more.

In the Handsboro soil the water table is near or above the surface, depending on the tide. Permeability is impeded by the water table. Organic matter content is about 16 to 35 percent. Natural fertility is very high.

Included with these soils in mapping are areas of soils that are similar to Bohicket and Handsboro soils but that have a silty clay loam or silty clay surface layer.

The natural vegetation consists of salt-tolerant plants such as black needlerush, big cordgrass, smooth cordgrass, marshhay cordgrass, sawgrass, seashore saltgrass, saltmarsh chloris, and seamyrtle. The lower-growing plants are bulltongue and arrow-arum.

These soils are not suited to crops or pasture. They have little or no agricultural value. Salt content and the water table severely restrict root development of plants that are not salt tolerant. The soils in this unit are also high in sulfur and after draining would be too acid for crops.

These soils are not suited to woodland. There are no trees except a few cypress and bay along the edges of the marsh where wave action has built up a considerable amount of sand.

The potential for wetland wildlife habitat is low. The vegetation provides shelter for wildlife. These soils are better suited to wildlife habitat than to other uses.

These soils have very low potential for urban development and for sanitary facilities because of the frequent flooding. There are no practical and reasonable measures to overcome the flooding.

These soils are in capability subclass VIIIw.

5—Bonifay loamy sand, 0 to 5 percent slopes. This well drained, nearly level to gently sloping soil is on broad and narrow ridgetops in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 15 to more than 100 acres in size, but some areas are as small as 5 acres.

Typically, the surface layer is very dark grayish brown loamy sand about 4 inches thick. The subsurface layer is loamy sand; the upper 2 inches is dark grayish brown, the next 24 inches is yellowish brown, and the lower 17 inches is brownish yellow with strong brown and very pale brown mottles. The upper 4 inches of the subsoil is yellowish brown sandy loam with strong brown, yellowish red, and brownish yellow mottles; and the lower 12 inches is mottled yellowish brown, very pale brown, strong brown, yellowish red, and red sandy loam or sandy clay loam. Common plinthite nodules make up 5 to 20 percent, by volume, of the subsoil.

Included with this soil in mapping are small areas of Albany, Fuquay, Lakeland, Pactolus, and Troup soils. Also included are a few small areas of soils that are similar to Bonifay soils but that contain less than 5 percent plinthite nodules above a depth of 60 inches or that have a sand and loamy fine sand surface layer. Also included are small areas where slope is 5 to 8 percent. Inclusions make up less than 15 percent of any mapped area.

In this Bonifay soil the water table is normally at a depth of more than 6 feet. However, water is perched above the plinthite layer for 1 to 5 days after heavy rainfall. Available water capacity is low in the upper 40 inches and moderate in the subsoil. Permeability is rapid in the surface layer and moderate in the plinthic subsoil. Natural fertility and organic matter content are low throughout. Runoff is slow, and the erosion hazard is slight.

The natural vegetation consists of longleaf and slash pine and a mixture of hardwoods including blackjack, post, and turkey oaks. The understory is mainly native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

Most areas of this soil remain in native vegetation. A few small areas have been cleared and used for crops.

This soil is moderately suited to crops. It is limited for row crops by droughtiness and susceptibility to leaching of plant nutrients. Management should increase available water capacity in the root zone. Row crops should be rotated with close-growing, soil-improving crops and winter cover crops. All crops should be limed and fertilized. The soil-improving crops and residue of all other crops should be plowed under.

This soil is moderately suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well and produce good ground cover if they are limed and fertilized. Yields are occasionally greatly reduced by extended severe droughts. Grazing should be controlled to maintain vigorous plants and good cover.

This soil has medium potential for longleaf and slash pine. Low available water capacity, low natural fertility, and rapid permeability limit the production of woodland. Equipment limitations, seedling mortality, and plant competition are moderate.

This soil has very high potential for dwellings without basements, low commercial buildings, and local roads and streets. It has high potential for septic tank absorption fields, trench sanitary landfills, and playgrounds. The potential for shallow excavations is medium. Shallow excavations require removal of the sandy overburden or shoring.

This soil is in capability subclass IIIs.

6—Chewacla-Wahee-Riverview association. These somewhat poorly drained and well drained, nearly level soils are on the flood plain of the Escambia River and are subject to periodic flooding. Slopes are 0 to 2 percent. The areas contain few old river runs cut off from the main channel, lakes, and numerous old sloughs that are filled with water. The Riverview soil is on the highest elevations of the flood plain. The Chewacla and Wahee soils are on the lower elevations and extend downward to the old sloughs. The areas of each soil range from 5 to 120 acres. The mapped areas of this association range from long and narrow to long and broad; they are larger than 1,000 acres.

This association is about 35 percent Chewacla soil, 35 percent Wahee soil, 20 percent Riverview soil, and 10 percent minor soils.

The Chewacla soil is somewhat poorly drained. Typically, the surface layer is dark brown silt loam about 7 inches thick. The upper 4 inches of the subsoil is brown silty clay loam; the next 5 inches is brown silty clay loam that has common grayish brown mottles; the next 11 inches is mottled gray, grayish brown, yellowish brown, brown, and strong brown silty clay loam; the next 16 inches is mottled gray, grayish brown, yellowish brown, brown, and strong brown sandy clay loam; and the lower 4 inches is mottled gray, yellowish brown, and strong brown sandy loam. The upper part of the underlying material is mottled gray, yellowish brown, and strong brown loamy sand to a depth of 50 inches, and the lower part is light gray sand to a depth of 63 inches.

In the Chewacla soil, the water table is above a depth of 18 inches for 2 to 6 months most years. Most areas are subject to frequent flooding. Permeability is moderate, and available water capacity is medium to high. Natural fertility is medium. Runoff is slow.

The Wahee soil is somewhat poorly drained. Typically, the surface layer is brown loam about 3 inches thick. The subsurface layer is brown loam about 5 inches thick. The upper 6 inches of the subsoil is pale brown clay with yellowish red, gray, and strong brown mottles; the next 9 inches is light brownish gray clay loam with yellowish brown, brown, and yellowish red mottles; the next 17 inches is light brownish gray clay loam with yellowish brown and brown mottles; and the lower 25 inches is gray clay mottled with brown, yellowish brown, and strong brown.

In the Wahee soil, the water table is at a depth of 12 to 30 inches. Internal drainage is slow to very slow, and permeability is slow. Natural fertility is low. Available water capacity is medium to high. Runoff is slow.

The Riverview soil is well drained. Typically, the surface layer is dark brown silt loam about 4 inches thick. The upper 20 inches of the subsoil is dark yellowish brown silty clay loam; the next 4 inches is dark yellowish brown sandy clay loam with brown mottles; and the lower 3 inches is yellowish brown fine sandy loam. The upper 5 inches of the underlying material is yellowish brown loamy sand, and the next 7 inches is yellowish brown sand, and the lower 21 inches is brownish yellow and light yellowish brown sand mottled with yellowish brown, dark yellowish brown, and very pale brown.

In the Riverview soil, the water table is at a depth of more than 64 inches. Many areas are subject to occasional flooding in winter or spring. Permeability is moderate in the upper part of the profile and rapid in the lower part. Natural fertility is medium. Available water capacity is medium in the upper part of the profile and low in the lower part. Runoff is slow.

Included with these soils in mapping are areas of Bibb soils and areas of poorly drained, clayey and loamy soils that are similar to Chewacla and Wahee soils. Also included are areas of poorly drained soils that are similar to Chewacla soils but that have a thinner surface layer and subsoil and a few small areas of soils that are similar to Riverview soils but that have a surface layer more than 20 inches thick. Also included are areas of well drained to moderately well drained soils that have a loamy layer less than 26 inches thick overlying sandy material, a few areas of soils that have a high silt content and a very dark gray or black surface layer more than 20 inches thick, and small narrow areas of moderately well drained to somewhat poorly drained sandy soils adjacent to streams.

The natural vegetation consists of water oak, bay, sweetgum, cypress, loblolly pine, sycamore, and blackgum. The understory consists of greenbrier, holly, maidencane, and muscadine vines.

All areas of this association remain in native vegetation, primarily a forest of mixed hardwoods. None of this association is used for cultivated crops or pasture grasses.

The soils in this association are poorly suited to cultivated crops and pasture grasses. The hazard of flooding by streams is the main limitation. Soils in the lower areas are also limited by poor drainage. However, with proper water control and good management, a few of the better drained areas at higher elevations are moderately suited to special crops and good quality pasture. The cost of clearing the dense vegetation and providing adequate drainage and adequate flood control, including dikes and levees, usually prohibits use.

The soils in this association have low potential for pine. The cost of adequate drainage, proper water control, good management, land clearing and other practices is prohibitive.

The soils in this association have very low potential for septic tank absorption fields, trench sanitary landfills, dwellings without basements, and low commercial buildings. There are no practical measures to overcome the limitations for these uses. These soils have low potential for shallow excavations, playgrounds, and local roads and streets. A combination of measures such as water control, mounding, filling, and flood control are necessary for these uses.

The Chewacla soil is in capability subclass IVw. The Wahee soil is in capability subclass IIIw. The Riverview soil is in capability subclass IIw.

7—Dorovan-Pamlico association. These nearly level, very poorly drained soils are in large hardwood swamps and on flood plains of major drainageways. Slopes are less than 1 percent. The Pamlico soil usually is on the outer part of the area, and the Dorovan soil is on the inner part. Areas of each soil range from 10 to 200 acres in size. Mapped areas of the association range from 20 to more than 750 acres in size.

This association is about 50 percent Dorovan soil, 30 percent Pamlico soil, and 20 percent minor soils.

Typically, the Dorovan soil is dark reddish brown or black muck to a depth of 63 inches or more.

In the Dorovan soil the water table is at or near the surface for most of the year. During droughty periods the water table may fluctuate between depths of 10 and 30 inches. Internal drainage is very slow because of the high water table. Permeability is moderate. Organic matter content and available water capacity are very high. Natural fertility is moderate.

Typically, the Pamlico soil has a surface layer of very dark brown muck 15 inches thick; it is approximately 30 percent fiber unrubbed and 15 percent rubbed. Below this is black muck 22 inches thick; it is about 10 percent fiber unrubbed and less than 10 percent rubbed. The underlying material is dark gray sand to a depth of more than 60 inches.

In the Pamlico soil the water table is at or near the surface for most of the year. During droughty periods the water table may fluctuate between depths of 10 and 30 inches. Internal drainage is very slow because of the high water table. Permeability is moderate. Organic matter content and available water capacity are very high. Natural fertility is moderate.

Minor soils include very poorly drained Pickney and Rutlege soils around the edge of mapped areas and sporadically throughout the areas. Also included are small islands, 1 to 5 acres in size, of poorly drained Bibb and Leon soils and somewhat poorly drained Pactolus soils.

The natural vegetation consists of baldcypress, blackgum, sweetbay, sweetgum, titi, and scattered slash pine and an understory of brackenfern, greenbrier, muscadine vine, and waxmyrtle.

Most areas of this association remain in native vegetation.

These soils are not suited to cultivated crops or pasture. They are severely limited by the continuous high water table. However, with adequate water control they would be suited to most vegetables. Drainage is difficult because of high cost and the unavailability of suitable outlets. A well designed and well maintained water control system is needed to keep the water at a proper depth for special crops and to reduce the hazard of subsidence resulting from oxidation of organic matter.

The potential of these soils for woodland is very low. Seedling mortality is very high because of the almost continuous high water table, which also very severely limits the use of equipment. Overcoming the excessive wetness of these soils is extremely difficult.

These soils have very low potential for urban uses. The thick layer of organic material and the high water table are the main limitations. Water control, removal of the organic material, and back-filling with suitable soil material overcome the limitations.

The Dorovan soil is in capability subclass VIIw. The Pamlico soil is in capability subclass VIIw.

8—Dothan fine sandy loam, 0 to 2 percent slopes. This well drained, nearly level soil is on broad and narrow ridgetops in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 20 to more than 100 acres in size, but some areas are as small as 5 acres.

Typically, the surface layer is fine sandy loam about 9 inches thick; the upper 5 inches is dark grayish brown, and the lower 4 inches is yellowish brown. The upper 4 inches of the subsoil is yellowish brown fine sandy loam; the next 30 inches is yellowish brown sandy clay loam; and the lower 20 inches is yellowish brown sandy clay loam or sandy clay with strong brown, red, brownish yellow, dark red, and very pale brown mottles. Common plinthite nodules make up more than 5 percent, by volume, of the lower part of the subsoil.

Included with this soil in mapping are small areas of Orangeburg and Fuquay soils. Also included are areas of soils that are similar to Dothan soils but that have a surface layer of loamy sand or loamy fine sand, a few

areas where slope is 2 to 5 percent, and a few small wet areas that are shown by a wet spot symbol. Also included are some areas of soils that are similar to Dothan soils but that contain less than 5 percent plinthite in the lower part of the subsoil. Inclusions make up less than 15 percent of any mapped area.

In this Dothan soil the water table is normally below a depth of 6 feet. After heavy rainfall the water table is perched at a depth of 42 to 48 inches for 1 or 2 weeks. Available water capacity is medium. Natural fertility and organic matter content are low. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Surface runoff is slow and the erosion hazard is slight.

The natural vegetation consists of longleaf and slash pine, various oaks, persimmon, and dogwood. The understory consists of native grasses and shrubs including huckleberry, blackberry, and gallberry. Pineland threeawn is the most common native grass.

Many areas of this soil have been cleared and are used for crops.

This soil is well suited to a variety of crops. It is highly productive under good management. All crop residue should be plowed under. This soil responds well to fertilizer and lime.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has high potential for longleaf and slash pine under a high level of management. It has no serious management problems.

This soil has very high potential for dwellings without basements, shallow excavations, low commercial buildings, playgrounds, and local roads and streets. It has high potential for trench sanitary landfills. This soil has medium potential for septic tank absorption fields. The absorption field area should be increased to compensate for the moderately slow permeability.

This soil is in capability class I.

9—Dothan fine sandy loam, 2 to 5 percent slopes. This well drained, gently sloping soil is on broad and narrow ridgetops in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 20 to more than 100 acres in size, but some areas are as small as 5 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 6 inches thick. The subsurface layer, where present, is brown or yellowish brown fine sandy loam about 6 inches thick. The subsoil is at a depth of less than 20 inches. The upper 8 inches of the subsoil is yellowish brown fine sandy loam; the next 16 inches is yellowish brown sandy clay loam; the next 13 inches is brownish yellow sandy clay loam with common strong brown and red mottles; and the lower 17 inches is mottled yellow, brown, and red sandy clay loam or sandy clay. Common plinthite nodules make up more than 5 percent, by volume, of the lower part of subsoil.

Included with this soil in mapping are small areas of Esto, Fuquay, and Orangeburg soils. Also included are small areas where slopes are 0 to 2 percent and 5 to 8 percent, a few small wet areas that are shown by a wet spot symbol, a few small areas of eroded soils, and areas of soils that are similar to Dothan soils but that have a surface layer of loamy sand or loamy fine sand. In some areas, primarily in the northeast part of the county in the Blackwater State Forest, are areas of soils that are similar to Dothan soils but that contain less than 5 percent plinthite above a depth of 60 inches and that are more than 20 percent silt in the upper 20 inches of the subsoil. Also included are a few areas of poorly drained soils in and along small stream bottom lands and drainageways. Inclusions make up less than 17 percent of any mapped area.

In this Dothan soil the water table is normally above a depth of 6 feet. After heavy rainfall the water table is perched at a depth of 42 to 48 inches for 1 to 2 weeks. Available water capacity is medium. Natural fertility and organic matter content are low. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Runoff is moderate on unprotected areas and the erosion hazard is moderate. This soil has a well aerated root zone and is loamy enough to have good tilth.

The natural vegetation consists of longleaf and slash pine, various oaks, persimmon, and dogwood. The understory consists of native grasses and shrubs including huckleberry, blackberry, and gallberry. Pineland threeawn is the most common native grass.

A large part of this soil is in forest. Much of the area of this soil has been cleared and is used for crops.

This soil is well suited to crops. It is highly productive under a high level of management and good conservation. This soil responds well to fertilizer and lime. Runoff is moderate and the major hazard to cultivation is erosion. Runoff can be reduced and erosion controlled by contour cultivation, terraces, and stabilized waterways. A cropping sequence that includes a close-growing crop and a winter cover crop helps protect the soil from erosion and maintain the organic matter content. All crop residue should be returned to the soil.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has high potential for longleaf and slash pine under a high level of management. It has no serious management problems.

This soil has very high potential for dwellings without basements, low commercial buildings, shallow excavations, and local roads and streets. It has high potential

for trench sanitary landfills and playgrounds. This soil has medium potential for septic tank absorption fields. The absorption field area should be increased to compensate for the moderately slow permeability.

This soil is in capability subclass IIe.

10—Dothan fine sandy loam, 5 to 8 percent slopes. This well drained, sloping soil is on broad and narrow side slopes along drainageways and between streams in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 10 to 40 acres in size, but some areas are as small as 5 acres.

Typically, the surface layer is fine sandy loam about 9 inches thick; the upper 5 inches is dark grayish brown and the lower 4 inches is yellowish brown. The subsoil is at a depth of less than 20 inches. The upper 6 inches of the subsoil is brownish yellow fine sandy loam; the next 20 inches is brownish yellow sandy clay loam; the next 8 inches is brownish yellow sandy clay loam with yellowish red, yellowish brown, and strong brown mottles; and the lower 20 inches is mottled strong brown, yellowish red, yellowish brown, brownish yellow, red, very pale brown, and light gray sandy clay loam or sandy clay. Common plinthite nodules make up more than 5 percent, by volume, of the lower part of the subsoil.

Included with this soil in mapping are small areas of Esto, Fuquay, and Orangeburg soils. Also included are a few areas where slopes are 2 to 5 percent or 8 to 12 percent, areas of soils that are similar to Dothan soils but that have a surface layer of loamy fine sand or loamy sand, a few small areas of eroded soils, and a few areas of poorly drained soils in and along small stream bottom lands and drainageways. In some areas, primarily in the northeastern part of the county in the Blackwater State Forest, are areas of soils that are similar to Dothan soils but that contain less than 5 percent plinthite above a depth of 60 inches and are more than 20 percent silt in the upper 20 inches of the subsoil. Inclusions make up less than 17 percent of any mapped area.

In this Dothan soil the water table is normally below a depth of 6 feet. After periods of heavy rainfall the water table is perched at a depth of 42 to 48 inches for 3 to 6 days. Available water capacity is medium. Natural fertility and organic matter content are low. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Runoff is moderate to rapid, and the erosion hazard is moderate to severe. Some type of crop or vegetation should remain on this soil to avoid serious erosion problems. This soil has a well aerated root zone and is loamy enough to have good tilth.

The natural vegetation consists of longleaf and slash pine, various oaks, persimmon, and dogwood. The understory consists of native grasses and shrubs including huckleberry, blackberry, and gallberry. Pineland threeawn is the most common native grass.

This soil is used mostly for timber. A few areas have been cleared and are used for crops.

This soil is moderately suited to crops. Slope and the erosion hazard are the main limitations. Erosion can be reduced by contour cultivation, terraces, and stabilized waterways. A cropping sequence including close-growing crops and winter cover crops in rotation with row crops helps reduce erosion, as does use of parallel strips of perennial grass on the contour. All crop residue should be returned to the soil. This soil responds well to fertilizer and lime.

This soil is moderately suited to pasture grasses. Bahiagrass and Coastal bermudagrass grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has high potential for longleaf and slash pine under a high level of management. It has no serious management problems.

This soil has very high potential for dwellings without basements, shallow excavations, and local roads and streets. It has high potential for trench sanitary landfills, low commercial buildings, and playgrounds. It has medium potential for septic tank absorption fields. The absorption field area should be increased to compensate for the moderately slow permeability.

This soil is in capability subclass IIIe.

11—Escambia fine sandy loam, 0 to 2 percent slopes. This somewhat poorly drained, nearly level soil is along narrow drainageways, around depressions, and on low flats. Slopes are smooth to concave. Areas of this soil range mostly from 5 to 70 acres in size.

Typically, the surface layer is very dark gray fine sandy loam in the upper 7 inches and brown fine sandy loam in the lower 3 inches. The upper 4 inches of the subsoil is yellowish brown fine sandy loam with strong brown mottles; the next 5 inches is brownish yellow fine sandy loam with strong brown, yellowish brown, and dark red mottles; and the lower 40 inches is fine sandy loam mottled in shades of red, brown, yellow, and gray. The lower part of the subsoil contains from 5 to 15 percent, by volume, of plinthite.

Included with this soil in mapping are small areas of Albany, Dothan, Lynchburg, and Rains soils. Also included are a few small areas of soils that are similar to Escambia soils but that contain less than 5 percent plinthite in the lower part of the subsoil or that have a surface layer more than 20 inches thick, or that have more than 18 percent clay in the upper 20 inches of the subsoil. Also included are a few small areas where slopes are 2 to 5 percent and a few areas of poorly drained soils in and along narrow stream bottom lands and drainageways. Inclusions make up less than 20 percent of any mapped area.

In this Escambia soil the water table is at a depth of 15 to 20 inches for 2 to 6 months in most years. Available water capacity is moderate. Natural fertility is low. Permeability is moderate above the plinthite layer and

moderately slow below a depth of about 19 inches. Internal drainage is moderately slow to slow and response to artificial drainage is moderately slow. Runoff is slow and the erosion hazard is slight.

The natural vegetation consists of longleaf and slash pine and water-tolerant hardwoods including sweetgum and water oak. The understory is mainly native grasses and low growing shrubs consisting of gallberry and water-tolerant plants. Pineland threeawn is the most common native grass.

Most areas of this soil remain in woodland. A few areas have been cleared and are used for crops and pasture.

If properly managed, this soil is moderately suited to cultivated crops. Good water control is needed. Cultivated crops should be planted in rotation with close-growing cover crops. Regular applications of lime and fertilizer are needed. All crop residue should be returned to the soil.

This soil is moderately well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are moderately well suited for pasture and hay when properly managed. Simple drainage is generally adequate to remove excess water. Regular applications of lime and fertilizer are needed. Grazing should be controlled to maintain vigorous plants and good cover.

This soil has high potential for loblolly, longleaf, and slash pine under good water control and a high level of management. The moderate equipment limitations and windthrow hazard are the primary management concerns.

This soil has high potential for dwellings without basements, low commercial buildings, and local roads and streets. Water control is necessary for these uses. This soil has medium potential for trench sanitary landfills, septic tank absorption fields, shallow excavations, and playgrounds. Water control, mounding, and filling overcome the limitations for these uses.

This soil is in capability subclass IIw.

12—Esto loam, 2 to 5 percent slopes. This well drained, gently sloping soil is on knolls and ridge crests in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 5 to 30 acres in size.

Typically, the surface layer is very dark grayish brown loam about 4 inches thick. The subsurface layer is yellowish brown loam about 3 inches thick. The upper 5 inches of the subsoil is yellowish brown clay loam; the next 4 inches is yellowish brown clay with strong brown mottles; the next 8 inches is brownish yellow clay with yellowish brown, yellowish red, and red mottles; and the next 37 inches is clay mottled in shades of gray, red, yellow, and brown. Below this is light gray clay mottled with red, brown, and yellow.

Included with this soil in mapping are small areas of Dothan, Fuquay, Orangeburg, and Tifton soils. Also included are small areas of eroded soils and a few areas where slopes are 5 to 8 percent. Also included are a few small areas of soils that are similar to Esto soils but that have a loamy fine sand and sandy loam surface layer or a sandy clay loam subsoil. Inclusions make up less than 18 percent of any mapped area.

In this Esto soil the water table is at a depth of more than 6 feet. Permeability is moderate in the surface layer and slow in the subsoil. The available water capacity is medium to low. Runoff is rapid and internal drainage is slow. The erosion hazard is severe. Natural fertility is low. The subsoil is dense and poorly aerated, and in many places root growth is restricted.

The natural vegetation consists of longleaf and slash pine, various oaks, hickory, and dogwood. The understory consists of native grasses and shrubs including blackberry, gallberry, and huckleberry. Pineland threeawn is the most common native grass.

Most areas of this soil remain in native vegetation. A few small areas have been cleared and are used for crops.

This soil is moderately suited to cultivated crops. Slow permeability, the clayey subsoil, and the hazard of erosion are the limitations. Cultivation requires intensive erosion control, including contour cultivation, terraces, and stabilized waterways. A cropping sequence that includes a close-growing crop and a winter cover crop helps protect the soil from erosion and maintain the organic matter content. All crop residue should be returned to soil.

This soil is moderately suited to pasture grasses. Bahiagrass and Coastal bermudagrass are moderately suited for pasture and hay when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has medium potential for longleaf and slash pine. Plant competition is moderate.

This soil has very high potential for trench sanitary landfills. It has high potential for shallow excavations and dwellings without basements. The potential for playgrounds, low commercial buildings, septic tank absorption fields and local roads and streets is medium. Specially designed footings and foundations are necessary for buildings and dwellings. The area of filter fields should be increased. Suitable fill is needed to increase soil strength for roads and streets.

This soil is in capability subclass IIIe.

13—Esto loam, 5 to 8 percent slopes. This well drained, sloping soil is on side slopes in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 5 to 30 acres in size.

Typically, the surface layer is dark grayish brown loam about 4 inches thick. The upper 3 inches of the subsoil is yellowish brown sandy clay loam; the next 5 inches is strong brown clay loam with yellowish red and red mottles; the next 12 inches is yellowish red clay with strong brown, red, and light gray mottles; and the lower 36

inches is clay mottled in shades of brown, red, yellow, and gray.

Included with this soil in mapping are areas of Dothan, Fuquay, Lucy, Orangeburg, and Tifton soils. Also included are areas of eroded soils and a few areas where slopes are 2 to 5 percent or 8 to 12 percent. Also included with this soil are a few small areas of soils that are similar to Esto soils but that have a loamy fine sand and sandy loam surface layer. Inclusions make up less than 18 percent of any mapped area.

In this Esto soil the water table is at a depth of more than 6 feet. Permeability is moderate in the surface layer and slow in the subsoil. Available water capacity is medium to low. Runoff is very rapid and internal drainage is slow. The erosion hazard is very severe. Natural fertility is low. The subsoil is dense and poorly aerated, and in many places root growth is restricted.

The natural vegetation consists of longleaf and slash pine, various oaks, hickory, and dogwood. The understory consists of native grasses and shrubs including blackberry, gallberry and pineland threeawn.

Most areas of this soil remain in native vegetation.

This soil is moderately suited to cultivated crops. Slow permeability, slope, the clayey subsoil, and the hazard of erosion are the limitations. Very intensive erosion control is needed. This soil is poorly suited to terracing and erosion control that depends primarily on plant cover. Row crops should be grown in narrow strips on the contour alternating with wider strips of close-growing crops. A cropping sequence that includes a close-growing crop and a winter cover crop helps protect the soil from erosion and maintain the organic matter content. All crop residue should be returned to the soil.

This soil is moderately suited to pasture grasses. Bahiagrass and Coastal bermudagrass are moderately suited for pasture and hay when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has medium potential for longleaf and slash pine. Plant competition is moderate.

This soil has high potential for trench sanitary landfills and dwellings without basements. It has medium potential for shallow excavations, playgrounds, low commercial buildings, septic tank absorption fields, and local roads and streets. Specially designed footings and foundations are necessary for buildings and dwellings. The area of filter fields should be increased. Suitable fill is needed to increase soil strength for roads and streets.

This soil is in capability subclass IVe.

14—Fuquay loamy sand, 0 to 5 percent slopes. This well drained, nearly level to gently sloping soil is primarily on broad and narrow ridgetops in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 15 to more than 100 acres in size, but some areas are as small as 5 acres.

Typically, the surface layer is dark grayish brown loamy sand about 4 inches thick. The subsurface layer is brown loamy sand in the upper 3 inches and yellowish brown loamy sand in the lower 19 inches. The upper 17 inches of the subsoil is yellowish brown sandy loam with strong brown mottles in the lower part; the next 16 inches is brownish yellow sandy clay loam with strong brown mottles; and the lower 21 inches is sandy loam mottled in shades of brown, yellow, gray, and red. The lower part of the subsoil contains more than 5 percent plinthite nodules above a depth of 60 inches.

Included with this soil in mapping are small areas of Albany, Bonifay, Dothan, Lakeland, Lucy, and Troup soils. Also included are a few small areas of soils that are similar to Fuquay soils but that contain less than 5 percent plinthite nodules above a depth of 60 inches or that have a sand and loamy fine sand surface layer. Also included are small areas where slopes are 5 to 8 percent. Inclusions make up less than 15 percent of any mapped area.

In this Fuquay soil the water table is normally at a depth of more than 6 feet. However, water is briefly perched above the plinthic layer during wet periods. Permeability is rapid in the surface layer, moderate in the upper part of the subsoil, and slow in the lower part of the horizon that contains plinthite. Available water capacity is low in the sandy layers and moderate in the subsoil. Runoff is slow, and the erosion hazard is slight. Natural fertility and organic matter content are low.

The natural vegetation consists of longleaf and slash pine, various oaks, and dogwood. The understory is mainly native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

A large part of the acreage remains in native vegetation. Many areas have been cleared and are used for crops.

This soil is well suited to a variety of crops. It is highly productive under good management. Droughtiness is the major limitation, and moderate conservation is needed to improve the soil for crops. The lack of moisture in the root zone during hot, dry summer months may cause crop damage. The cropping sequence should include perennial grasses or cover crops that produce large amounts of crop residue. This soil responds well to the fertilizer and lime.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. This soil responds well to fertilizer and lime. Grazing should be controlled to maintain vigorous plants and good cover.

This soil has medium potential for longleaf and slash pine under a high level of management. Seedling mortality and equipment limitations are moderate.

This soil has very high potential for dwellings without basements, low commercial buildings, and local roads and streets. It has high potential for trench sanitary landfills and shallow excavations. The potential for septic

tank absorption fields and playgrounds is medium. The absorption field area should be increased to compensate for the slow permeability. Sodding and filling are necessary.

This soil is in capability subclass IIs.

15—Fuquay loamy sand, 5 to 8 percent slopes. This well drained, sloping soil is on side slopes in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 5 to 80 acres in size.

Typically, the surface layer is dark grayish brown loamy sand about 4 inches thick. The subsurface layer is olive brown loamy sand in the upper 4 inches and yellowish brown loamy sand in the lower 22 inches. The upper 5 inches of the subsoil is yellowish brown sandy loam; the next 15 inches is brownish yellow sandy clay loam with red mottles; and the lower 13 inches is sandy loam mottled in shades of brown, yellow, and red. The lower part of the subsoil contains more than 5 percent plinthite nodules above a depth of 60 inches.

Included with this soil in mapping are small areas of Bonifay, Dothan, Lakeland, Lucy, and Troup soils. Also included are a few areas of soils that are similar to Fuquay soils but that have a sand and loamy fine sand surface layer or that contain less than 5 percent plinthite nodules above a depth of 60 inches. Also included are a few areas where slopes are 0 to 5 percent or 8 to 12 percent, small areas of poorly drained soils in and along narrow stream bottom lands and drainageways, and a few shallow and deep gullies. Inclusions make up less than 15 percent of any mapped area.

In this Fuquay soil the water table is normally at a depth of more than 6 feet. However, water is briefly perched above the plinthic layer during wet periods. Permeability is rapid in the surface layer, moderate in the upper part of the subsoil, and slow in the lower part of the horizon that contains plinthite. Available water capacity is low in the sandy layers and medium in the subsoil. Runoff is medium. The erosion hazard is moderate to severe where the soil is not protected. Natural fertility and organic matter content are low.

The natural vegetation is longleaf and slash pine, various oaks, and dogwood. The understory is mainly native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

Most areas of this soil remain in woodland. A few areas have been cleared and are used for crops.

This soil is suited to a variety of crops. Steepness makes cultivation more difficult and increases the hazard of erosion. Droughtiness is the main limitation. Good management and moderate erosion control are needed. Contour cultivation is usually sufficient, but alternate strips of perennial grasses are needed in some areas. This soil responds well to fertilizer and lime. Row crops should be rotated in sequence with close-growing, soil-improving crops and winter cover crops. All crop residue should be left on the soil or plowed under.

This soil is moderately well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. Steepness increases the erosion hazard. Good stands of grass can be produced by fertilizing and liming. Controlling grazing helps to maintain vigorous plants and good cover.

This soil has medium potential for longleaf and slash pine. Equipment limitations and seedling mortality are moderate.

This soil has very high potential for dwellings without basements and local roads and streets. It has high potential for trench sanitary landfills, low commercial buildings, and shallow excavations. The potential for septic tank absorption fields and playgrounds is medium. The absorption field area should be increased to compensate for the slow permeability. Landscaping and sodding are needed on playgrounds.

This soil is in capability subclass IIIs.

16—Garcon loamy fine sand. This somewhat poorly drained, nearly level soil is on broad low positions in the flatwoods. Slopes are less than 2 percent. Areas of this soil range mostly from 10 to 100 acres in size.

Typically, the surface layer is loamy fine sand about 8 inches thick; the upper 4 inches is very dark gray, and the lower 4 inches is dark grayish brown. The subsurface layer is loamy fine sand; the upper 12 inches is yellowish brown, and the lower 11 inches is brownish yellow with light brownish gray and yellowish brown mottles. The upper 8 inches of the subsoil is yellowish brown fine sandy loam; the next 12 inches is gray fine sandy loam with reddish brown and red mottles; and the lower 7 inches is mottled gray, pale brown, strong brown, and yellowish brown loamy fine sand. The underlying sandy material extends to a depth of 80 inches; the upper 11 inches is gray fine sand with yellowish brown, strong brown, and light reddish brown mottles, and the lower 11 inches is yellowish red fine sand with light brownish gray, yellowish brown, red, and strong brown mottles.

Included with this soil in mapping are small areas of Albany, Mulat, and Pactolus soils. Also included are a few small areas of soils that are similar to Garcon soils but that have a loamy sand and fine sand surface layer. Inclusions make up less than 15 percent of any mapped area.

In this Garcon soil the water table is at a depth of 20 to 40 inches for 4 to 6 months during most years. Available water capacity is medium above a depth of about 8 inches, low between depths of 8 and 31 inches, medium between depths of 31 and 51 inches, and low below a depth of 51 inches. Natural fertility is low. Permeability is rapid above a depth of about 31 inches, moderate between depths of 31 and 51 inches, and rapid below a depth of 51 inches.

The natural vegetation consists of longleaf and slash pine and various oaks. The understory is mainly gall-

berry, grassleaf goldaster, running oak, palmetto, and pineland threeawn.

Most areas of this soil remain in woodland.

This soil has moderate limitations for cultivated crops because of wetness. Only crops that are tolerant of periodic wetness can be grown. Tile drains or open drainage ditches are needed for most crops. Crops are subject to occasional damage from excess water during growing or harvesting seasons. Crop rotations should include close growing cover crops at least half the time. Soil-improving cover crops and all crop residue should be left on the ground or plowed under. Good management also includes good seedbed preparation, fertilizing, and liming.

This soil is moderately suited to pasture grasses and legumes. Bahiagrass, tall fescue, Coastal bermudagrass, and clovers are moderately well suited for pasture and hay when properly managed. They respond moderately well to fertilizer and lime. Grazing should be controlled to maintain vigorous plants and good cover.

This soil normally has moderate to moderately high potential for longleaf and slash pine. It has high potential for pine with good water control and a high level of management. Seedling mortality is the main management problem.

This soil has high potential for dwellings without basements, low commercial buildings, and local roads and streets. Water control is necessary for these uses. This soil has medium potential for septic tank absorption fields, shallow excavations, and playgrounds. Water control, mounding, and filling may overcome these limitations. Shoring is also needed in shallow excavations. This soil has low potential for trench sanitary landfills. Suitable fill should be used as sealer and daily cover for landfills.

This soil is in capability subclass IIw.

17—Gullied land. Gullied land consists of areas where the soil has been removed by water, resulting in an intricate network of V-shaped or U-shaped channels. Only small patches or narrow strips of soil remain between the gullies. Most of the surface layer has been removed from most of these areas. Gullied land is mainly in the northern part of the county. In most areas slopes are steeper than 5 percent. Areas range from a few acres to about 75 acres in size.

Included in mapping are a few areas between the large gullies where the soils still have part of the original surface layer. The soils between the gullies are the same as the surrounding soils.

The gullies have cut into soils that range from sandy to clayey. The exposed materials are equally varied in texture. Most of the gullies are more than 5 feet deep and have steep sides. In many areas erosion is still active, but a few of these gullied areas are stabilized. Runoff is rapid and the erosion hazard is severe.

The vegetation is sparse—only a few slash and long leaf pine, various oaks, and dogwood. Some areas support no vegetation. Any vegetation that grows helps to stabilize the areas.

Gullied land is not suited to cultivated crops or to pasture. It can be used for woodland if active erosion is stopped. Gullied land has very low potential for urban uses. If these areas are to be used, suitabilities and limitations should be evaluated after onsite investigation.

Gullied land is not placed in a capability class.

18—Johns fine sandy loam. This somewhat poorly drained to moderately well drained, nearly level soil is on stream terraces primarily along the larger streams. Slopes range from 0 to 2 percent. Areas of this soil range mostly from 10 to 120 acres in size, but a few areas are as small as 5 acres.

Typically, the surface layer is fine sandy loam about 9 inches thick; the upper 5 inches is very dark grayish brown, and the lower 4 inches is dark grayish brown. The upper 10 inches of the subsoil is light yellowish brown loam; the next 3 inches is yellowish brown sandy clay loam with light brownish gray and strong brown mottles; and the next 13 inches is mottled gray, yellowish brown, strong brown, and yellowish red sandy clay loam. The underlying sandy material extends to a depth of 63 inches; the upper 8 inches is mottled light gray, gray, very pale brown, yellowish brown, and strong brown stratified loamy sand and sand with pockets of sandy loam, and the lower 20 inches is mixed light gray and white sand with olive yellow mottles.

Included with this soil in mapping are small areas of Albany, Escambia, Kalmia, Lynchburg, and Pactolus soils. Also included are a few areas of soils that are similar to Johns soils but in which the subsoil extends to a depth of more than 40 inches, in which the surface layer is more than 20 inches thick, or in which the surface layer is loamy sand. Also included are small areas where slopes are 2 to 5 percent, small areas of poorly drained soils that have a clayey subsoil, and small areas of poorly drained soils in and along narrow stream bottom lands and drainageways. Inclusions make up about 15 percent of any mapped area.

In this Johns soil the water table is at a depth of 18 to 36 inches for 2 to 6 months most years. Available water capacity is moderate. Natural fertility is low. Permeability is moderately rapid above a depth of 19 inches, moderate between depths of 19 and 35 inches, and rapid below a depth of 35 inches. Runoff is slow.

The natural vegetation consists of longleaf and slash pine, water oak, and holly. The understory is mainly native grasses and low growing shrubs including gallberry, waxmyrtle, and greenbriar. Pineland threeawn is the most common native grass.

Most areas of this soil remain in woodland. A few areas have been cleared and are used for crops and pasture.

If properly managed this soil is moderately suited to cultivated crops. It is moderately limited by wetness. Good water control is needed. Crops are subject to occasional damage by excess water during growing or harvesting seasons. Good seedbed preparation and regular applications of lime and fertilizer are needed. Cultivated crops should be planted in rotation with close-growing cover crops. All crop residue should be left on the soil or plowed under.

This soil is moderately well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are moderately well suited for pasture and hay when properly managed. Simple drainage is generally adequate to remove excess water. Regular applications of lime and fertilizer are needed. Grazing should be controlled to maintain vigorous plants and good cover.

This soil normally has medium potential for slash and loblolly pine. It has high potential for pine with good water control and a high level of management. Equipment limitations are moderate.

This soil has a high potential for dwellings without basements, low commercial buildings, playgrounds, and local roads and streets. Water control is necessary for these uses. This soil has medium potential for septic tank absorption fields and shallow excavations. Water control, mounding, and filling may overcome the limitations for these uses. Shoring is needed in shallow excavations. The potential for trench sanitary landfills is low. Water control is needed and suitable fill should be used as sealer and daily cover for landfills.

This soil is in capability subclass IIw.

19—Kalmia loamy fine sand, 2 to 5 percent slopes. This well drained, gently sloping soil is on stream terraces, primarily along the larger streams in the county. Slopes are smooth to concave. Areas of this soil range mostly from 10 to 70 acres in size, but a few areas are as small as 5 acres.

Typically, the surface layer is dark grayish brown loamy fine sand about 4 inches thick. The subsurface layer is light yellowish brown loamy fine sand about 4 inches thick. The upper 6 inches of the subsoil is light yellowish brown sandy loam; the next 10 inches is yellowish brown sandy clay loam; the next 12 inches is brownish yellow sandy clay loam; and the lower 3 inches is brownish yellow sandy loam. The underlying sandy material extends to a depth of 65 inches; the upper 13 inches is brownish yellow and pale yellow loamy sand with yellow and gray mottles, and the lower 13 inches is yellow fine sand with brownish yellow and light gray mottles.

Included with this soil in mapping are small areas of Johns, Maxton, and Angie Variant soils. Also included are a few areas of soils that are similar to Kalmia soils but in which the subsoil extends to a depth of more than 40 inches, in which the surface layer is more than 20 inches thick, or in which the surface layer is sandy loam. Also included are small areas where slopes are 0 to 2 percent or 5 to 8 percent. Inclusions make up about 17 percent of any mapped area.

In this Kalmia soil the water table is at a depth of more than 6 feet. Available water capacity is low above a depth of about 14 inches, moderate between depths of 14 and 39 inches, and low below a depth of 39 inches. Natural fertility is low. Permeability is rapid above a depth of about 14 inches, moderate between depths of 14 and 39 inches, and rapid below a depth of 39 inches. Runoff is medium, and the erosion hazard is moderate.

The natural vegetation consists of longleaf and slash pine, various oaks, dogwood, and sweetgum. The understory consists of native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

Most areas of this soil remain in woodland.

This soil is well suited to a variety of cultivated crops. It is highly productive under good management. Runoff is moderate and the major hazard to cultivation is erosion. Runoff can be reduced and erosion controlled by contour cultivation, terraces, and stabilized waterways. A cropping sequence that includes close-growing crops and winter cover crops helps protect the soil from erosion and maintain the organic matter content. All crop residue should be returned to the soil. Liming and regular fertilizing are needed.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has high potential for longleaf and slash pine. It has no serious management problems.

This soil has very high potential for dwellings without basements, low commercial buildings, and local roads and streets. It has high potential for septic tank absorption fields and playgrounds. The potential for shallow excavations and trench sanitary landfills is medium. Shoring is needed in shallow excavations. Suitable fill should be used as sealer and daily cover for landfills.

This soil is in capability subclass IIe.

20—Kureb sand, 0 to 8 percent slopes. This excessively drained, nearly level to sloping soil is on broad uplands on the coastal plain. The soil is mostly gently sloping and nearly level. Slopes are smooth to concave. Areas of this soil range mostly from 50 to 800 acres in size, but a few areas are as large as 1,000 acres and some areas are as small as 15 acres.

Typically, the surface layer is gray sand about 3 inches thick that has a salt-and-pepper appearance. The underlying layers are sand to a depth of more than 80 inches. The upper 13 inches is light gray; the next 8 inches is yellowish brown with tongues of light gray in the upper 5 inches from the horizon above and common strong brown mottles; the next 15 inches is yellowish brown;

the next 16 inches is light yellowish brown; and the lower 25 inches is very pale brown.

Included with this soil in mapping are small areas of Lakeland and Pactolus soils. Also included are small areas of wetter soils that are shown on the soil map by a wet spot symbol. Inclusions make up less than 10 percent of any mapped area. Some areas, especially along bays, contain abrupt dropoffs, which are designated by an escarpment symbol.

In this Kureb soil the water table is at a depth of more than 72 inches. Available water capacity is very low. Permeability is very rapid. Organic matter content and natural fertility are very low.

The natural vegetation is sand pine, live oak, and turkey oak. The understory is dominantly pineland threeawn, running oak, other annual forbs and grasses, and sparse sawpalmetto.

A large part of the acreage of this soil is in natural vegetation. This soil is poorly suited to cultivated crops and only fairly suited to improved pasture. Bahiagrass makes only fair growth when fertilized. Droughtiness is the major limitation. Liming and frequent fertilizing are needed for the best production.

This soil has medium potential for sand pine and low potential for slash pine. Equipment limitations are moderate, and seedling mortality is severe.

This soil has very high potential for septic tank absorption fields, dwellings without basements, and local roads and streets. It has high potential for low commercial buildings. This soil has medium potential for trench sanitary landfills, shallow excavations, and playgrounds. Suitable fill should be used as sealer and daily cover for sanitary landfills. Excavations need filling or shoring. Paving, sodding, or filling is needed on playgrounds.

This soil is in capability subclass VIs.

21—Lakeland sand, 0 to 5 percent slopes. This excessively drained, nearly level to gently sloping soil is primarily on broad ridgetops in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 40 to more than 300 acres in size, but some areas are larger than 1,000 acres and some are as small as 5 acres.

Typically, the surface layer is dark grayish brown sand about 4 inches thick. The underlying layers are sand to a depth of more than 83 inches. The upper 28 inches is yellowish brown with dark grayish brown streaks in the upper 4 inches; the next 30 inches is yellowish brown with very pale brown mottles; and the lower 21 inches is very pale brown with yellowish brown and brownish yellow mottles.

Included with this soil in mapping are small areas of Bonifay, Ortega, Pactolus, and Troup soils. Also included are small areas where slopes are 5 to 8 percent and small areas of wetter soils that are shown on the soil map by a wet spot symbol. Inclusions make up about 15 percent of any mapped area.

In this Lakeland soil the water table is at a depth of more than 72 inches. Available water capacity is low or very low (fig. 7). Organic matter content and natural fertility are very low. Permeability is very rapid. Runoff is slow, and the erosion hazard is slight.

The natural vegetation consists of longleaf and slash pine, turkey oak, blackjack oak, post oak, and a few water oak. The understory is mainly native grasses and shrubs. Pineland threeawn is the most common native grass.

Most areas of this soil remain in native vegetation.

This soil is poorly suited to cultivated crops. Droughtiness is the major limitation. Very low or low available water capacity makes this soil very droughty in dry periods. This soil is also susceptible to leaching of plant nutrients. Using a cropping sequence that includes regular close-growing crops helps improve soil condition. All crop residue should be returned to the soil. Placing row crops on the contour helps retain water and retard erosion. Terracing is not practical on this soil. Liming and frequent fertilizing are needed for the best production.

This soil is moderately suited to pasture and hay. Deep rooting plants such as bahiagrass and Coastal bermudagrass are well suited but periodic droughts reduce production. Regular fertilizing and liming are needed. Grazing should be controlled to maintain vigorous plants.

This soil has medium potential for sand pine and low potential for longleaf and slash pine. Low available water capacity and low inherent fertility limit use of these soils for forest. Equipment limitations and seedling mortality are moderate.

This soil has very high potential for septic tank absorption fields, dwellings without basements, and local roads and streets. It has high potential for low commercial buildings. This soil has medium potential for trench sanitary landfills, shallow excavations, and playgrounds. Suitable fill should be used as a sealer and daily cover for sanitary landfills. Shallow excavations need filling or shoring. Paving, sodding, or filling is needed on playgrounds.

This soil is in capability subclass IVs.

22—Lakeland sand, 5 to 12 percent slopes. This excessively drained, sloping to strongly sloping soil is primarily on upland hillsides leading to drainageways and around depressions. Slopes are smooth to concave. Areas of this soil range mostly from 30 to more than 100 acres in size, but some areas are as small as 5 acres.

Typically, the surface layer is dark grayish brown sand about 3 inches thick. The underlying layers are sand to a depth of more than 80 inches. The upper 31 inches is yellowish brown; the next 23 inches is brownish yellow with splotches of very pale brown; the next 19 inches is yellowish brown with splotches of very pale brown; and the lower 4 inches is yellow with splotches of very pale brown.

Figure 7.—Golf course on Lakeland sands. These droughty soils must be watered daily for grass to survive.

Included with this soil in mapping are small areas of Albany, Bonifay, Fuquay, Lucy, Pactolus, and Troup soils. Also included are small areas of poorly drained soils in and along narrow stream bottoms and drainageways, a few areas where slopes are 12 to 30 percent, and a few shallow and deep gullies. Inclusions make up less than 17 percent of any mapped area.

In this Lakeland soil the water table is at a depth of more than 72 inches. Available water capacity is low or very low. Organic matter content and natural fertility are very low. Permeability is very rapid. Runoff is slow to medium. The erosion hazard is moderate where the soil is not protected.

The natural vegetation consists of longleaf and slash pine, turkey oak, blackjack oak, post oak, and a few water oak. The understory is mainly native grasses and shrubs. Pineland threeawn is the most common native grass.

Most areas of this soil remain in native vegetation.

This soil is not suited to cultivated crops. Steepness, low available water capacity, low inherent fertility, and susceptibility to erosion are the main limitations.

This soil is poorly suited to pasture grasses. Deep rooted plants such as bahiagrass and Coastal bermudagrass are well suited, but periodic droughts reduce production. Soil blowing and water erosion are hazards on newly seeded pastures. Grazing should be carefully controlled. Regular liming and fertilizing are needed.

This soil has medium potential for sand pine and low potential for longleaf and slash pine. Slope, low available water capacity, and low inherent fertility are the main limitations. Equipment limitations and seeding mortality are moderate.

This soil has very high potential for septic tank absorption fields. It has high potential for dwellings without basements and local roads and streets. The major limitation is steepness. This soil has medium potential for low commercial buildings. Landshaping may be needed on sites for dwellings without basements and low commercial buildings. This soil has low potential for trench sanitary landfills, shallow excavations, and playgrounds. Suit-

able fill should be used as a sealer and daily cover for sanitary landfills. Shallow excavations need filling or shoring. Paving, sodding, or filling in addition to landscaping are needed on playgrounds.

This soil is in capability subclass VIs.

23—Lakeland sand, 12 to 30 percent slopes. This excessively drained, steep soil is primarily on upland hillsides leading to drainageways and depressions. Slopes are smooth to concave. Areas of this soil range mostly from 20 to 80 acres in size, but some areas are as small as 5 acres.

Typically, the surface layer is dark grayish brown sand about 3 inches thick. The underlying layers are sand to a depth of more than 80 inches. The upper 46 inches is yellowish brown with mottles of very pale brown in the lower part; the next 27 inches is brownish yellow with mottles of very pale brown; and the lower 4 inches is yellow with mottles of very pale brown.

Included with this soil in mapping are small areas of Albany, Bonifay, Fuquay, Lucy, Pactolus, and Troup soils, normally along slope breaks and around stream heads. Also included are small areas of poorly drained soils in and along narrow stream bottoms and drainageways, a few areas where slopes are 8 to 12 percent, and a few areas of moderately eroded soils that have many shallow gullies and a few deep gullies. Inclusions make up less than 17 percent of any mapped area.

In this Lakeland soil the water table is at a depth of more than 72 inches. Available water capacity is low or very low. Organic matter content and natural fertility are very low. Permeability is very rapid. Runoff is medium. The erosion hazard is severe where the soil is not protected.

The natural vegetation consists of longleaf and slash pine, turkey oak, blackjack oak, post oak, and a few water oak. The understory is mainly native grasses and shrubs. Pineland threeawn is the most common native grass.

Most areas of this soil remain in native vegetation.

This soil is not suited to cultivated crops and is very poorly suited to pasture grasses. Steepness, low available water capacity, low inherent fertility, and susceptibility to erosion are the main limitations.

This soil has medium potential for sand pine and low potential for longleaf and slash pine. Erosion hazard, equipment limitations, and seedling mortality are moderate. Steepness, low available water capacity, and low inherent fertility are the main limitations.

This soil has high potential for septic tank absorption fields, dwellings without basements, and local roads and streets. The major limitation is steepness. This soil has medium potential for low commercial buildings because of slope. This soil has low potential for trench sanitary landfills, shallow excavations, and playgrounds. Suitable fill should be used as sealer and daily cover for sanitary landfills. Shallow excavations need filling or shoring. Paving, sodding, or filling in addition to landscaping are needed on playgrounds.

This soil is in capability subclass VIIs.

24—Leon sand, 0 to 2 percent slopes. This poorly drained, nearly level soil is on broad low positions on the Coastal Plain. Slopes are less than 2 percent. Areas of this soil range mostly from 5 to 90 acres in size.

Typically, the surface layer is very dark gray sand about 2 inches thick. The subsurface layer is grayish brown sand about 14 inches thick. The subsoil is a dark reddish brown, dark brown, and brown sand that is coated with organic matter and is about 16 inches thick. The upper 12 inches of the substratum is very pale brown sand with dark brown stains along root channels, the next 12 inches is light brownish gray sand, and the lower 24 inches is white sand.

Included with this soil in mapping are small areas of Pactolus and Rutlege soils. Also included are a few areas of soils that are similar to Leon soils but in which the very dark gray surface layer is thicker or the organic-coated layer is more than 30 inches below the surface. Also included are a few areas where slopes are 2 to 5 percent. Inclusions make up less than 15 percent of any mapped area.

In this Leon soil the water table is at a depth of 15 to 30 inches for more than 9 months during most years. It is at a depth of less than 10 inches for 1 to 4 months during periods of heavy rainfall and recedes to a depth of more than 40 inches during some dry seasons. Available water capacity is low in the root zone. Natural fertility is low. Runoff and internal drainage are slow. Permeability is rapid in the surface layer and moderate to moderately rapid in the subsoil.

The natural vegetation consists of longleaf and slash pine and water oak. The understory is mainly native grasses and low growing shrubs, primarily gallberry, running oak, and sawpalmetto. Pineland threeawn is the most common native grass.

Most of the acreage of this soil remains in natural vegetation.

This soil is not suited to cultivated crops. They are very severely limited by wetness and poor soil quality. The selection of crops is limited except under very intensive management and good water control. A complete water control system is needed. Row crops should be rotated with soil improving crops. All crop residue should be returned to the soil. Lime and fertilizer are needed for the best production.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. Water control is needed to remove excess water during heavy rains. Regular applications of fertilizer and lime are needed. Grazing should be controlled to maintain vigorous plants.

This soil normally has low potential for longleaf and slash pine. Plant competition, windthrow hazard, seedling

mortality, and equipment limitations are moderate. With good, high level management, potential is medium.

This soil has medium potential for septic tank absorption fields, low commercial buildings, buildings without basements, and local roads and streets. It has low potential for shallow excavations and playgrounds. This soil has a very low potential for trench sanitary landfills. Mounding, water control, or filling overcome the limitations.

This soil is in capability subclass IVw.

25—Lucy loamy sand, 0 to 5 percent slopes. This well drained, nearly level to gently sloping soil is primarily on broad ridgetops in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 15 to more than 100 acres in size, but some areas are as small as 5 acres.

Typically, the surface layer is very dark grayish brown loamy sand about 10 inches thick. The subsurface layer is brown loamy sand about 8 inches thick. Below this is a layer of yellowish red loamy sand about 8 inches thick. The upper 8 inches of the subsoil is yellowish red sandy loam, the next 7 inches is red sandy loam, and the lower 39 inches is red sandy clay loam.

Included with this soil in mapping are small areas of Dothan, Fuquay, Orangeburg, Red Bay, and Troup soils. Also included are a few areas of soils that are similar to Lucy soils but that have a sand and loamy fine sand surface layer or darker red colors in the lower part of the subsoil. Also included are small areas where slopes are 5 to 8 percent. Inclusions make up about 15 percent of any mapped area.

In this Lucy soil the water table is at a depth of more than 6 feet. Natural fertility and organic matter content are low. Available water capacity is low in the sandy layers and medium in the subsoil. Permeability is rapid in the sandy layers and moderate in the subsoil. Runoff is slow and the erosion hazard is slight.

The natural vegetation consists of longleaf and slash pine, various oaks, and dogwood. The understory is mainly native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

Much of the acreage of this soil remains in native vegetation. Extensive areas have been cleared and are used for crops.

This soil is well suited to a variety of crops. It is highly productive under good management. This soil responds well to fertilizer and lime. Droughtiness is the major limitation and moderate conservation is needed to improve the soil for crops. The lack of moisture in the root zone during hot, dry summer months may cause crop damage. The cropping sequence should include perennial grasses or cover crops that produce large amounts of residue.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. This soil responds well to fertilizer and lime. Grazing should be controlled to maintain vigorous plants and good cover.

This soil has medium potential for longleaf and slash pine. Equipment limitations and seedling mortality are moderate.

This soil has very high potential for dwellings without basements, low commercial buildings, and local roads and streets. It has high potential for septic tank absorption fields, trench sanitary landfills, shallow excavations, and playgrounds.

This soil is in capability subclass IIs.

26—Lucy loamy sand, 5 to 8 percent slopes. This well drained, sloping soil is on long, narrow hillsides in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 5 to 80 acres in size.

Typically, the surface layer is dark grayish brown loamy sand about 5 inches thick. The subsurface layer is strong brown loamy sand about 12 inches thick. Below this is a layer of yellowish red loamy sand about 11 inches thick. The upper 7 inches of the subsoil is yellowish red sandy loam, and the lower 45 inches is red sandy clay loam.

Included with this soil in mapping are small areas of Dothan, Fuquay, Orangeburg, and Troup soils. Also included are a few areas of soils that are similar to Lucy soils but that have a sand and loamy fine sand surface layer. Also included are small areas of poorly drained soils in and along narrow stream bottoms and drainageways, a few areas where slopes are more than 8 percent, and a few shallow and deep gullies. Inclusions make up about 15 percent of any mapped area.

In this Lucy soil the water table is at a depth of more than 6 feet. Natural fertility and organic matter content are low. Available water capacity is low in the sandy layers and medium in the subsoil. Permeability is rapid in the sandy layers and moderate in the subsoil. Runoff is medium, and the erosion hazard is moderate.

The natural vegetation consists of longleaf and slash pine, various oaks, and dogwood. The understory is mainly native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

A few areas have been cleared, but most areas of this soil remain in woodland.

This soil is suited to a variety of crops. Steepness makes cultivation more difficult and increases the hazard of erosion. Droughtiness is the main limitation. Good management and moderate erosion control are needed. Contour cultivation is usually sufficient, but alternate strips of perennial grasses are needed in some areas. All crop residue should be returned to the soil. This soil responds well to fertilizer and lime; however, fertilizer is leached rapidly.

This soil is moderately well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. The steepness increases the erosion hazard. Good stands of grass can be produced by fertil-

izing and liming. Grazing should be controlled to maintain vigorous plants and good cover.

This soil has medium potential for longleaf and slash pine. Equipment limitations and seedling mortality are moderate.

This soil has very high potential for dwellings without basements and local roads and streets. It has high potential for septic tank absorption fields, trench sanitary landfills, low commercial buildings, and shallow excavations. The potential for playgrounds is medium. Playgrounds need landscaping and sodding.

This soil is in capability subclass IIIs.

27—Lynchburg fine sandy loam. This somewhat poorly drained, nearly level soil is along narrow drainageways, around depressions, and on low flats between small streams. Slopes are less than 2 percent. Areas of this soil range mostly from 10 to more than 100 acres in size, but a few areas are as small as 5 acres.

Typically, the surface layer is very dark gray fine sandy loam about 4 inches thick. The subsurface layer is light yellowish brown loam about 5 inches thick. The upper 8 inches of the subsoil is light yellowish brown loam with yellowish brown and gray mottles; the next 8 inches is light yellowish brown loam with gray, red, and strong brown mottles; the next 35 inches is sandy clay loam mottled in shades of gray, yellow, brown, and red; and the lower 20 inches is clay loam mottled in shades of gray, yellow, brown, and red.

Included with this soil in mapping are small areas of Albany, Angie Variant, Dothan, Escambia, Kalmia, and Rains soils. Also included are a few areas of soils that are similar to Lynchburg soils but that have a surface layer more than 20 inches thick, that are sandy clay or clay below a depth of 40 inches, or that have a very dark gray or black surface layer more than 8 inches thick. Also included are small areas of poorly drained soils in and along narrow stream bottom lands and drainageways and a few small areas where slopes are 2 to 5 percent. Inclusions make up less than 17 percent of any mapped area.

In this Lynchburg soil the water table is at a depth of less than 12 inches for 1 to 3 months during spring and winter in most years. Available water capacity is medium. Natural fertility is low. Permeability is moderate above a depth of about 25 inches and moderately slow below a depth of about 25 inches. Internal drainage is moderately slow to slow and response to artificial drainage is moderately slow. Runoff is slow.

The natural vegetation consists of longleaf and slash pine, sweetgum, blackgum, and various oaks. The understory is mainly native grasses and low growing shrubs such as gallberry and water-tolerent plants. Pineland threeawn is the most common native grass.

Most areas of this soil remain in woodland. A few areas have been cleared and are used for crops and pasture.

If properly managed this soil is moderately suited to cultivated crops. This soil is moderately limited by wetness. Good water control is needed. Crops are subject to occasional damage by excess water during growing or harvesting seasons. Good management includes good seedbed preparation and regular applications of lime and fertilizer. Cultivated crops should be rotated with close-growing cover crops. All crop residue should be left on the soil or plowed under.

This soil is moderately well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are moderately well suited for pasture and hay when properly managed. Simple drainage is generally adequate to remove surface water. Regular applications of lime and fertilizer are needed. Grazing should be controlled to maintain vigorous plants and good cover.

This soil normally has medium to high potential for longleaf, slash, and loblolly pine. It has high potential for pine with good water control and high level management. Equipment limitations are moderate.

This soil has high potential for dwellings without basements, low commercial buildings, and local roads and streets, but water control is necessary. This soil has medium potential for trench sanitary landfills, septic tank absorption fields, shallow excavations, and playgrounds. Water control, mounding, and filling may overcome the limitations for these uses.

This soil is in capability subclass IIw.

28—Maxton loamy fine sand, 2 to 5 percent slopes. This well drained, gently sloping soil is on stream terraces primarily along the larger streams. Most areas of this soil are at higher elevations adjacent to the Escambia River. Slopes are smooth to concave. Areas of this soil range mostly from 10 to 50 acres in size.

Typically, the surface layer is dark grayish brown loamy fine sand about 6 inches thick. The subsurface layer is dark yellowish brown loamy fine sand about 4 inches thick. The upper 9 inches of the subsoil is strong brown sandy loam, the next 13 inches is yellowish red sandy clay loam, and the lower 6 inches is yellowish red sandy loam. The underlying material, to a depth of 72 inches, is brownish yellow and white sand with yellow and brown mottles.

Included with this soil in mapping are small areas of Kalmia and Angie Variant soils. Also included are a few areas of soils that are similar to Maxton soils but on which the subsoil extends to a depth of more than 40 inches. Also included are small areas where slopes are 0 to 2 percent slopes and a few small areas of soils that are similar to Maxton soils but that have a surface layer more than 20 inches thick or a clayey subsoil. Inclusions make up about 15 percent of any mapped area.

In this Maxton soil the water table is at a depth of more than 6 feet. Available water capacity is low in the upper 14 inches, medium between depths of 14 and 38 inches, and low below a depth of 38 inches. Natural

fertility is low. Permeability is moderately rapid above a depth of about 14 inches, moderate between depths of 14 and 38 inches, and rapid below a depth of 38 inches. Runoff is moderate.

The natural vegetation consists of longleaf and slash pine, sweetgum, various oaks, and dogwood. The understory consists of native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

Most areas of this soil remain in woodland.

This soil is well suited to a variety of cultivated crops. It is highly productive under good management. Runoff is moderate and the major hazard to cultivation is erosion. Runoff can be reduced and erosion controlled by contour cultivation, terraces, and stabilized waterways. A cropping sequence that includes close-growing crops and winter cover crops helps protect the soil from erosion and maintain the organic matter content. All crop residue should be returned to the soil. Liming and regular fertilizing are needed.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has high potential for longleaf and slash pine. It has no serious management problems.

This soil has very high potential for dwellings without basements, low commercial buildings, and local roads and streets. It has high potential for septic tank absorption fields and playgrounds. The potential for shallow excavations and trench sanitary landfills is medium. Shoring is needed in shallow excavations. Suitable fill should be used as sealer and daily cover for trench sanitary landfills.

This soil is in capability subclass IIe.

29—Mulat loamy fine sand. This poorly drained, nearly level soil is in low-lying areas and in the flatwoods of the lower Coastal Plain. Slopes are less than 1 percent. Areas of this soil range mostly from 10 to more than 100 acres in size.

Typically, the surface layer is black loamy fine sand about 4 inches thick. The upper 6 inches of the subsurface layer is dark gray loamy fine sand with brown and very dark gray mottles, the next 7 inches is grayish brown fine sand with dark yellowish brown and brown mottles, and the lower 10 inches is light brownish gray sand with yellowish brown and brown mottles. The upper 7 inches of the subsoil is gray fine sandy loam with yellowish brown and grayish brown mottles, and the lower 15 inches is gray fine sandy loam with yellowish brown and dark gray mottles. The underlying material extends to a depth of 80 inches; the upper 8 inches is pinkish gray sand with light brownish gray mottles, the next 14 inches is light brownish gray sand with pinkish gray mottles, and the lower 9 inches is gray fine sand with dark gray mottles.

Included with this soil in mapping are small areas of Garcon, Lynchburg, Pactolus, Rains, and Rutlege soils. Also included are a few small areas of soils that are similar to Mulat soils but that have a loamy sand and fine sand surface layer. Inclusions make up less than 15 percent of any mapped area.

In this Mulat soil the water table is above a depth of 10 inches for 6 to 8 months during most years and varies between the depths of 10 and 30 inches during droughty periods. The soils are ponded or have water above the soil surface for less than 1 month during the wettest season. Surface and internal drainage are slow under natural conditions. This soil has medium available water capacity above a depth of about 10 inches, low between depths of 10 and 27 inches, medium between depths of 27 and 49 inches, and low below a depth of 49 inches. Permeability is rapid above a depth of about 27 inches, moderately slow between depths of 27 and 49 inches, and rapid below a depth of 49 inches.

The natural vegetation consists of baldcypress, pitcherplant, gallberry, and pineland threeawn (fig. 8).

Figure 8.—Pitcherplant bog at Garcon Point. Soil is Mulat loamy fine sand.

Most areas of this soil remain in natural vegetation.

This soil is poorly suited to cultivated crops. The shallow water table is the main limitation.

This soil is moderately suited to pasture but requires intensive management. Bahiagrass, Coastal bermudagrass and white clover are moderately suited for pasture

and hay. Drainage is needed to remove excess water. The pasture grasses grow well with adequate water control, a high level of management, and good conservation. Regular applications of fertilizer and lime are needed. Grazing should be controlled to maintain vigorous plants and good cover.

This soil has high potential for baldcypress. Equipment limitations and seedling mortality are the main management concerns.

This soil has medium potential for local roads and streets and low potential for dwellings without basements, low commercial buildings, shallow excavations, and playgrounds. It has very low potential for septic tank absorption fields and trench sanitary landfills. Wetness and the shallow water table are the limitations. Water control, mounding, and filling help overcome these limitations. In addition, shoring is needed in shallow excavations. Suitable fill should be used as a sealer and daily cover for landfills.

This soil is in capability subclass IIIw.

30—Orangeburg sandy loam, 0 to 2 percent slopes. This well drained, nearly level soil is on broad and narrow ridgetops in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 15 to 100 acres in size, but some areas are as small as 5 acres.

Typically, the surface layer is brown sandy loam about 8 inches thick. The upper 6 inches of the subsoil is brown sandy loam, the next 11 inches is red sandy clay loam, and the lower 48 inches is dark red sandy clay loam with strong brown mottles in the lower part.

Included with this soil in mapping are small areas of Dothan, Fuquay, Lucy, and Red Bay soils. Also included are a few areas where slopes are 2 to 5 percent and a few small wet spots that are shown by a drainage symbol. Also included are a few areas of soils that are similar to Orangeburg soils but that have a loamy sand and loamy fine sand surface layer. Inclusions make up less than 15 percent of any mapped area.

In this Orangeburg soil the water table is at a depth of more than 6 feet. Available water capacity is medium. Natural fertility and organic matter content are low. Permeability is moderately rapid in the surface layer and moderate in the subsoil. Runoff is slow and the erosion hazard is slight. This soil has a well aerated root zone and is loamy enough to have good tilth.

The natural vegetation consists of longleaf and slash pine, various oaks, dogwood, hickory, and persimmon. The understory is mainly native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

Many areas of this soil have been cleared and are used for crops.

This soil is well suited to a variety of crops. It is highly productive under good management. Good seedbed preparation, fertilizing, liming, and crop rotation help keep the soil in good condition. Cover crops should be alternated with row crops. All crop residue should be plowed under.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has high potential for longleaf and slash pine. It has no serious management concerns.

This soil has high potential for trench sanitary landfills, dwellings without basements, low commercial buildings, shallow excavations, playgrounds and local roads and streets. It has high potential for septic tank absorption fields.

This soil is in capability class I.

31—Orangeburg sandy loam, 2 to 5 percent slopes. This well drained, gently sloping soil is on broad and narrow ridgetops in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 15 to 80 acres in size.

Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsurface layer is pale brown sandy loam about 5 inches thick. The upper 8 inches of the subsoil is yellowish red sandy loam, and the lower 55 inches is red sandy clay loam. In a few places, the lower part of the subsoil has mottles of red, yellow, or brown.

Included with this soil in mapping are small areas of Dothan, Fuquay, Lucy, and Red Bay soils. Also included are a few areas where slopes are 0 to 2 percent, a few small wet spots, a few areas of eroded soils, and a few shallow and deep gullies. Also included are a few areas of soils that are similar to Orangeburg soils but that have a loamy sand and loamy fine sand surface layer. Inclusions make up less than 15 percent of any mapped area.

In this Orangeburg soil the water table is at a depth of more than 6 feet. Available water capacity is medium. Natural fertility and organic matter content are low. Permeability is moderately rapid in the surface and subsurface layers and moderate in the subsoil. Runoff is moderate to rapid where the soil is not protected, and the erosion hazard is moderate. This soil has a well aerated root zone and is loamy enough to have good tilth.

The natural vegetation consists of longleaf and slash pine, various oaks, dogwood, hickory, and persimmon. The understory is mainly native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

Many areas of this soil have been cleared and are used for crops.

This soil is well suited to a variety of crops. It is highly productive under good management. Runoff is moderate, and the major hazard to cultivation is erosion. Runoff can be reduced and erosion controlled by contour cultivation, terraces, and stabilized waterways. A cropping

sequence that includes close-growing crops and winter cover crops helps protect the soil from erosion and maintain the organic matter content. All crop residue should be returned to the soil. This soil responds well to the fertilizer and lime.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has high potential for longleaf and slash pine. It has no serious management concerns.

This soil has very high potential for trench sanitary landfills, dwellings without basements, low commercial buildings, shallow excavations, and local roads and streets. It has high potential for septic tank absorption fields and playgrounds.

This soil is in capability subclass IIe.

32—Orangeburg sandy loam, 5 to 8 percent slopes. This well drained, sloping soil is on long, narrow hillsides in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 10 to 40 acres in size.

Typically, the surface and subsurface layers are brown sandy loam about 11 inches thick. The subsoil is yellowish red sandy loam in the upper 7 inches and red sandy clay loam to a depth of more than 73 inches. In a few places the lower part of the subsoil has mottles of red, yellow, or brown.

Included with this soil in mapping are small acres of Dothan, Fuquay, Lucy, and Red Bay soils. Also included are a few areas where slopes are 2 to 5 percent or 8 to 12 percent, a few areas of eroded soils, and a few shallow and deep gullies. Also included are a few areas of soil that are similar to Orangeburg soils but that have a loamy sand and loamy fine sand surface layer and a few areas of poorly drained soils in and along narrow bottom lands and drainageways. Inclusions make up less than 15 percent of any mapped area.

In this Orangeburg soil the water table is at a depth of more than 6 feet. Available water capacity is medium. Natural fertility and organic matter content are low. Permeability is moderately rapid in the surface and subsurface layers and moderate in the subsoil. Runoff is rapid where the soil is not protected, and the erosion hazard is severe. This soil has a well aerated root zone.

The natural vegetation consists of longleaf and slash pine, various oaks, dogwood, hickory, and persimmon. The understory is mainly native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

A few areas of this soil have been cleared and are used for crops.

This soil is moderately suited to a variety of crops. It is severely limited for cultivated crops by the hazard of erosion. Erosion can be reduced by contour cultivation, terraces, and stabilized waterways. A cropping sequence including close-growing crops and winter cover crops in rotation with row crops reduces erosion, as do parallel strips of perennial grasses on the contour. All crop residue should be returned to the soil. This soil responds well to fertilizer and lime.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has high potential for longleaf and slash pine. It has no serious management problems.

This soil has very high potential for trench sanitary landfills, dwellings without basements, shallow excavations, and local roads and streets. It has high potential for septic tank absorption fields, low commercial buildings, and playgrounds.

This soil is in capability subclass IIIe.

33—Ortega sand, 0 to 5 percent slopes. This moderately well drained, nearly level to gently sloping soil is primarily on broad areas that are slightly higher than the adjacent flatwoods. Slopes are smooth to concave. Areas of this soil range mostly from 5 to 150 acres in size, but some areas are as large as 300 acres.

Typically, the surface layer is very dark gray sand about 4 inches thick. The underlying material is sand to a depth of more than 80 inches; the upper 41 inches is brownish yellow, the next 7 inches is very pale brown with common to few light gray and brownish yellow mottles, and the lower 28 inches is white with many pale brown and few yellowish red and reddish yellow mottles.

Included with this soil in mapping are small areas of Kureb, Lakeland, Leon, and Pactolus soils. Also included are small areas of soils that are similar to Ortega soils but that have a white surface layer about 12 inches thick. Inclusions make up about 12 percent of any mapped area.

In this Ortega soil, the water table is between depths of 40 and 60 inches during most of the year. During dry periods the water table may drop below a depth of 60 inches for 2 weeks to 2 months. Heavy rainfall may cause the water table to rise above a depth of 40 inches for 1 to 10 days. Organic matter content, available water capacity, and natural fertility are low. Permeability is very rapid. The erosion hazard is slight.

The natural vegetation is turkey oak and scattered longleaf and slash pine, live oak, laurel oak, bay, and a few sand pine. The understory is very sparse pineland threeawn, sawpalmetto, chalky bluestem, lopsided indiangrass, moss, and greenbriar.

Many areas of this soil are on native vegetation. No cultivated crops are grown on these soils.

This soil is poorly suited to cultivated crops. Low available water capacity makes these soils very droughty. Supplemental irrigation is needed but is not practical.

The soil is also susceptible to leaching of plant nutrients, so frequent application of lime and fertilizer are necessary.

This soil is poorly suited to pasture. Deep-rooting plants such as bahiagrass and Coastal bermudagrass can be grown. Regular fertilizing and liming are needed. Irrigation is also needed but is impractical. Grazing should be controlled to maintain plant growth.

This soil is moderately suited to longleaf and slash pine. Low available water capacity and low inherent fertility are the limitations. Equipment limitations, seedling mortality, and plant competition are moderate.

This soil has very high potential for dwellings without basements and local roads and streets. It has high potential for low commercial buildings and septic tank absorption fields. This soil has medium potential for shallow excavations and playgrounds. The potential for trench sanitary landfills is low. Filling or shoring are needed in shallow excavations. Paving, sodding, or filling is needed on playgrounds. Suitable fills should be used as sealer and daily cover for sanitary landfills.

This soil is in capability subclass IIIs.

34—Pactolus loamy sand, 0 to 5 percent slopes. This moderately well drained to somewhat poorly drained, nearly level to gently sloping soil is on low positions in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 10 to more than 200 acres in size, but some areas are as small as 5 acres.

Typically, the surface layer is very dark gray loamy sand about 5 inches thick. The subsurface layer is dark grayish brown loamy sand about 3 inches thick with very dark gray streaks along root channels. The underlying material is sand to a depth of more than 80 inches. The upper 9 inches is light yellowish brown with dark grayish brown streaks along root channels; the next 13 inches is brownish yellow with yellowish brown and light gray mottles; the next 22 inches is coarsely mottled in shades of yellow, brown, and gray; and the lower 28 inches is white with yellow and very pale brown mottles.

Included with this soil in mapping are small areas of Albany, Bonifay, Lakeland, Leon, Rutlege, and Troup soils. Also included are a few small areas of poorly drained soils that have a light colored surface layer and gray mottles above a depth of 20 inches and a few areas of soils that are similar to Pactolus soils but that are 5 to 10 percent silt plus clay between depths of 10 and 40 inches. Also included are a very few small areas where slopes are 5 to 8 percent. Inclusions make up less than 15 percent of any mapped area.

In this Pactolus soil the high water table is at a depth of 18 to 30 inches for 2 to 4 months during most years. Available water capacity, natural fertility, and organic matter content are low. Permeability is rapid. Runoff is slow, and the erosion hazard is slight.

The natural vegetation consists of longleaf and slash pine, dogwood, and various oaks. The understory is mainly gallberry, waxmyrtle, huckleberry, and pineland threeawn.

Most areas of this soil remain in woodland. A few areas have been cleared and are used for crops and pasture.

If properly managed this soil is moderately suited to cultivated crops, but good water control is needed. Cultivated crops should be planted on the contour in rotation with close-growing, soil-improving crops. All crops should be limed and fertilized. Soil-improving cover crops and all crop residue should be left on the ground or plowed under.

This soil is moderately well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are moderately well suited for pasture and hay. They grow well when properly managed. Grazing should be controlled to maintain vigorous plants and good cover. Regular applications of lime and fertilizer are needed.

This soil has medium potential for loblolly and slash pine under high-level management. Equipment limitations, seedling mortality, and plant competition are moderate.

This soil has high potential for septic tank absorption fields, dwellings without basements, low commercial buildings, and local roads and streets. It has medium potential for shallow excavations and playgrounds and low potential for trench sanitary landfills. If this soil is used for sanitary landfills, the sandy overburden should be removed and suitable fill should be used as sealer and daily cover. All urban uses require water control, mounding, or shoring.

This soil is in capability subclass IIIs.

35—Pickney loamy sand. This very poorly drained, nearly level soil is in low-lying areas and hardwood swamps. Slopes are less than 2 percent. Areas of this soil range mostly from 10 to 200 acres in size, but a few areas are as large as 650 acres.

Typically, the surface layer is black loamy sand in the upper 35 inches and very dark gray sand in the lower 23 inches. The underlying material is grayish brown sand in the upper 7 inches and mottled dark brown, very dark grayish brown, and very dark gray sand to a depth of 70 inches.

Included with this soil in mapping are small areas of Dorovan, Pamlico, Leon, Pactolus, and Rutlege soils. Also included are a few small areas of very poorly drained soils that have a sandy clay loam subsoil and a few small areas of poorly drained soils that have accumulations of decomposed organic matter in the subsoil below a depth of 50 inches. Inclusions make up less than 20 percent of any mapped area.

In this Pickney soil the water table is at or near the surface during most of the year. Water ponds at times. During periods of low rainfall, the water table may fluctuate between depths of 10 and 30 inches. Under natural conditions internal drainage is slow, but response to arti-

ficial drainage is rapid. Natural fertility and available water capacity are moderate. Permeability is rapid.

The natural vegetation consists of titi, blackgum, bay, and scattered slash pine. The understory consists of waxmyrtle, greenbriar, and pitcherplant.

Most of the area is titi swamps. A few areas have been cleared.

This soil is poorly suited to cultivated crops. The shallow water table is the main limitation. With good water control, high-level management, and good conservation, this soil has moderate potential for cultivated crops.

This soil is moderately well suited to pasture grasses. Tall fescue, bahiagrass, and white clover are moderately well suited for pasture and hay. Surface ditches are needed in most areas to remove excess water during heavy rains. The pasture grasses grow well with adequate water control, high-level management, and good conservation. Regular applications of fertilizer and lime are needed. Grazing should be controlled to maintain vigorous plants.

This soil has high potential for loblolly pine and cypress. The severe equipment limitations and seedling mortality are caused by excessive wetness. Adequate water control is necessary before trees can be planted.

This soil has low potential for septic tank absorption fields and local roads and streets. It has very low potential for shallow excavations, playgrounds, low commercial buildings, dwellings without basements, and trench sanitary landfills. Wetness and the shallow water table are the limitations. Water control and filling are necessary. Shoring is also needed in shallow excavations.

This soil is in capability subclass VIw.

36—Pits. Pits are open excavations from which sandy and loamy material has been removed, primarily for use in the construction and repair of roads and as fill material for foundations. Areas of pits are throughout the county. The excavations range from 4 feet to more than 12 feet in depth. The total acreage is small. Mapped areas generally range from 5 to 25 acres in size. Areas that are too small to map separately are shown by a special symbol.

In some areas, mixtures of sand, sandy loam, sandy clay loam, and clayey material are piled or scattered around the edges of the pits. This material has been mixed to the extent that identification of individual soils is not possible.

Most areas are almost barren. Some of the pits have been abandoned, but many are still being used.

Pits have little or no value for farming or forestry. Therefore, no interpretations, limitations, or ratings of potential are given. Any use of these areas should be evaluated after onsite investigation.

Pits are not assigned to a capability subclass.

37—Rains fine sandy loam. This poorly drained, nearly level soil is in low-lying positions on the Coastal Plain. Slopes are less than 2 percent. Areas of this soil range from 5 to 40 acres in size.

Typically, the surface layer is very dark gray fine sandy loam 5 inches thick. The subsoil is dark gray sandy loam 4 inches thick. The underlying material is gray sandy clay loam to a depth of more than 63 inches and has common mottles in shades of brown, yellow, and red in the lower 15 inches.

Included with this soil in mapping are small areas of Angie Variant, Escambia, and Lynchburg soils. Also included are a few small areas of soils that are similar to Rains soils but that have a thick black surface layer high in organic matter, have a loamy fine sand or sandy loam surface layer, or have a clay loam to clay subsoil. Inclusions make up less than 15 percent of any mapped area.

In this Rains soil the water table is at a depth of less than 10 inches or is above the surface for 2 to 6 months in most years. Available water capacity is moderate. Natural fertility is low. Permeability is moderately rapid above a depth of 5 inches and moderate below this depth. Internal drainage is moderately slow to slow and response to artificial drainage is moderately slow. Runoff is slow.

The natural vegetation consists of blackgum and scattered cypress and longleaf pine. The understory consists of gallberry, pineland threeawn, and water-tolerant grasses and shrubs.

Most areas remain in natural vegetation. A few small areas have been cleared and are used for pasture.

This soil is poorly suited to cultivated crops. It is limited by wetness. Good water control is needed because crops are subject to damage by excess water during growing or harvesting seasons. Good management includes good seedbed preparation and regular application of lime and fertilizer. Cultivated crops should be planted in rotation with close-growing cover crops. All crop residue should be returned to the soil.

In most areas this soil is poorly suited to pasture grasses. Bahiagrass and Coastal bermudagrass are moderately well suited for pasture and hay when properly managed. The moderately high water table during the early part of the growing season limits root growth and development; however, with adequate drainage, proper water control, and good management this soil has high potential for good quality pasture. Regular applications of lime and fertilizer increase plant growth.

This soil has medium potential for slash and loblolly pine. Adequate drainage, proper water control and good management are necessary. Seedling mortality and equipment limitations are severe.

This soil has low potential for septic tank absorption fields, trench sanitary landfills, shallow excavations, playgrounds, dwellings without basements, low commercial buildings, and local roads and streets. Water control is needed for all these uses. Filling and special footings and foundations are also needed for some uses.

This soil is in capability subclass IVw.

38—Red Bay sandy loam, 0 to 2 percent slopes. This well drained, nearly level soil is in broad areas in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 40 to more than 200 acres in size.

Typically, the surface layer is dark reddish brown sandy loam about 8 inches thick. The upper part of the subsoil is dark reddish brown sandy clay loam about 6 inches thick, and the lower part is dark red sandy clay loam to a depth of more than 60 inches.

Included with this soil in mapping are small areas of Dothan, Lucy, and Orangeburg soils. Also included are a few areas where slopes are 2 to 5 percent and a few small wet spots in drainageways. Also included are a few areas of soils that are similar to Red Bay soils but that have a loamy sand surface layer or that are sandy clay in the lower part of the subsoil. Inclusions make up less than 15 percent of any mapped area.

In this Red Bay soil the water table is at a depth of more than 6 feet. Available water capacity is medium. Natural fertility and organic matter content are moderately low. Permeability is moderately rapid in the surface layer and moderate in the subsoil. Surface runoff is slow, and the erosion hazard is slight. This soil has a well aerated root zone and is loamy enough to have good tilth.

The natural vegetation consists of longleaf and slash pine, various oaks, hickory, dogwood, and persimmon. The understory is mainly native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

Most areas of this soil have been cleared and are used for crops.

This soil is well suited to a variety of crops. It is highly productive under good management. Good seedbed preparation, fertilizing, liming and crop rotation keep the soil in good condition. Cover crops should be alternated with row crops. All crop residue should be plowed under.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has high potential for loblolly and slash pine. It has no serious management problems.

This soil has very high potential for trench sanitary landfills, dwellings without basements, low commercial buildings, shallow excavations, playgrounds, and local roads and streets. It has high potential for septic tank absorption fields.

This soil is in capability class I.

39—Red Bay sandy loam, 2 to 5 percent slopes. This well drained, gently sloping soil is on broad ridgetops in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 10 to 50 acres in size.

Typically, the surface layer is dark reddish brown sandy loam about 6 inches thick. The subsoil is dark red sandy clay loam to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Dothan, Lucy, and Orangeburg soils. Also included are a few areas where slopes are 0 to 2 percent or 5 to 8 percent, a few areas of eroded soils, and a few small wet areas that are shown by a wet spot symbol. Also included are a few areas of soils that are similar to Red Bay soils but that have a loamy sand surface layer or that are sandy clay in the lower part of the subsoil. Inclusions make up less than 15 percent of any mapped area.

In this Red Bay soil the water table is at a depth of more than 6 feet. Available water capacity is medium. Natural fertility and organic matter content are moderately low. Permeability is moderately rapid in the surface layer and moderate in the subsoil. Runoff is moderate to rapid where the soil is not protected, and the erosion hazard is moderate. This soil has a well aerated root zone and is loamy enough to have good tilth.

The natural vegetation consists of longleaf and slash pine, various oaks, hickory, dogwood, and persimmon. The understory is mainly native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

Many areas of this soil have been cleared and are used for crops.

This soil is well suited to a variety of crops. It is highly productive under good management. Runoff is moderate and the major hazard to cultivation is erosion. Runoff can be reduced and erosion controlled by contour cultivation, terraces, and stabilized waterways. A cropping sequence that includes close-growing crops and winter cover crops helps protect the soil from erosion and maintain the organic matter content. All crop residue should be returned to the soil. This soil responds well to fertilizer and lime.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has high potential for loblolly and slash pine. It has no serious management problems.

This soil has very high potential for trench sanitary landfills, shallow excavations, low commercial buildings, dwellings without basements, and local roads and streets. It has high potential for septic tank absorption fields and playgrounds.

This soil is in capability subclass IIe.

40—Rutlege loamy sand. This very poorly drained, nearly level soil is along small stream bottoms, in ponded areas, and on low upland flats. Slopes are less than 2 percent. Areas of this soil range mostly from 20

to 60 acres in size, but a few areas are larger than 100 acres and some are as small as 5 acres.

Typically, the surface layer is black loamy sand about 12 inches thick. The subsurface layer is very dark gray loamy sand about 9 inches thick. Below this is gray sand that extends to a depth of more than 60 inches.

Included with this soil in mapping are small areas of Pactolus, Pickney, Leon, Dorovan, and Pamlico soils. Also included are areas of somewhat poorly drained to poorly drained sandy soils that have a thin black or very dark gray surface layer less than 10 inches thick and a few small areas of soils that have a mixed or stratified sandy loam or sandy clay loam subsoil. Also included are a few areas of soils that are similar to Rutlege soils but that have a sand surface layer. Inclusions make up less than 18 percent of any mapped area.

In this Rutlege soil the water table is at or near the surface for long periods. Many areas are ponded in wet seasons. Available water capacity is moderate to high in the root zone. Natural fertility is moderate. Permeability is rapid throughout. Runoff is very slow or ponded. Internal drainage is slow but response to artificial drainage is rapid.

The natural vegetation consists of titi, blackgum, scattered slash and longleaf pine, and silverleaf bay. The understory is mainly native grasses and low growing shrubs, primarily gallberry, waxmyrtle, and pitcherplant.

Most areas of this soil remain in natural vegetation.

This soil is poorly suited to cultivated crops. The shallow water table is the main limitation. With good water control, high-level management, and good conservation, this soil has moderate potential for cultivated crops.

This soil is moderately well suited to pasture grasses. Surface ditches are needed in most areas to remove excess surface water during heavy rains. Improved pasture grasses grow well with adequate water control, high-level management, and good conservation. Regular applications of fertilizer and lime are needed. Grazing should be controlled to maintain vigorous plants and good cover.

This soil has high potential for loblolly pine and cypress. The severe equipment limitations and seedling mortality are caused by excessive wetness. Adequate water control is necessary before trees can be planted.

This soil has low potential for septic tank absorption fields and local roads and streets. It has very low potential for shallow excavations, playgrounds, low commercial buildings, dwellings without basements, and trench sanitary landfills. Wetness and the shallow water table are the limitations. Water control and filling are needed for all urban uses. Shoring is also needed in shallow excavations.

This soil is in capability subclass VIw.

41—Tifton sandy loam, 0 to 2 percent slopes. This nearly level, well drained soil is on broad and narrow ridgetops in the uplands. Slopes are less than 2 percent. Areas of this soil range mostly from 10 to 40 acres in size, but some areas are as small as 5 acres.

Typically, the surface layer is brown sandy loam about 8 inches thick. The upper 22 inches of the subsoil is yellowish brown sandy clay loam; the next 12 inches is brownish yellow sandy clay loam with strong brown and red mottles; the next 16 inches is sandy clay loam mottled in shades of red, brown, and yellow; and the lower 12 inches is sandy clay mottled in shades of red, brown, yellow, and gray. Common iron concretions make up about 15 percent, by volume, of the upper 60 inches. Common plinthite nodules make up more than 5 percent, by volume, of the lower part of the subsoil.

Included with this soil in mapping are small areas of Dothan, Fuquay, and Orangeburg soils. Also included are a few small areas where slope is 2 to 5 percent and a few areas of soils that are similar to Tifton soils but that have a loamy sand surface layer. Inclusions make up less than 15 percent of any mapped area.

In this Tifton soil the water table is at a depth of more than 6 feet. Available water capacity is medium. Permeability is moderate. Natural fertility and organic matter content are low. Runoff is slow and the erosion hazard is slight.

The natural vegetation consists of longleaf and slash pine, various oaks, persimmon, and dogwood. The understory consists of native grasses and shrubs including huckleberry, blackberry, and gallberry. Pineland threeawn is the most common native grass.

Many areas of this soil have been cleared and are used for crops.

This soil is well suited to a variety of crops. It is highly productive under good management. Good seedbed preparation, fertilizing, liming, and crop rotation help keep the soil in good condition. Cover crops should be alternated with row crops. All crop residue should be plowed under.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has high potential for longleaf, slash, and loblolly pine. It has no serious management problems.

This soil has very high potential for trench sanitary landfills, dwellings without basements, low commercial buildings, shallow excavations, playgrounds, and local roads and streets. It has high potential for septic tank absorption fields.

This soil is in capability class I.

42—Tifton sandy loam, 2 to 5 percent slopes. This well drained, gently sloping soil is on broad and narrow ridgetops in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 10 to 90 acres in size, but a few areas are as small as 5 acres.

Typically, the surface layer is dark grayish brown sandy loam about 9 inches thick. The upper 5 inches of the subsoil is yellowish brown sandy loam; the next 7 inches is yellowish brown sandy clay loam; the next 12 inches is yellowish brown sandy clay loam with few strong brown mottles; and the lower 37 inches is sandy clay loam mottled in shades of yellow, brown, and red. Iron concretions are common in the upper 60 inches. Common plinthite nodules make up about 10 percent, by volume, of the lower part of the subsoil.

Included with this soil in mapping are small areas of Dothan, Esto, Fuquay, and Orangeburg soils. Also included are a few small areas where slopes are 0 to 2 percent, some areas of eroded soils, and a few small wet spots. Also included are a few areas of soils that are similar to Tifton soils but that have a loamy sand surface layer or that have plinthite at a depth of less than 30 inches. Inclusions make up less than 15 percent of any mapped area.

In this Tifton soil the water table is at a depth of more than 6 feet. Available water capacity is medium. Permeability is moderate in the subsoil. Natural fertility and organic matter content are low. Runoff is moderate to rapid where the soil is not protected, and the erosion hazard is moderate.

The natural vegetation consists of longleaf and slash pine, various oaks, persimmon, and dogwood. The understory consists of native grasses and shrubs including huckleberry, blackberry, and gallberry. Pineland threeawn is the most common native grass.

Many areas of this soil have been cleared and are used for crops.

This soil is well suited to a variety of crops. It is highly productive under good management. Runoff is moderate and the major hazard to cultivation is erosion. Runoff can be reduced and erosion controlled by contour cultivation, terraces, and stabilized waterways. A cropping sequence that includes close-growing crops and winter cover crops helps protect the soil from erosion and maintain the organic matter content. All crop residue should be returned to soil. This soil responds well to fertilizer and lime.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has a high potential for longleaf, slash, and loblolly pine. It has no serious management problems.

This soil has very high potential for trench sanitary landfills, dwellings without basements, low commercial buildings, shallow excavations, and local roads and streets. It has high potential for septic tank absorption fields and playgrounds.

This soil is in capability subclass IIe.

43—Tifton sandy loam, 5 to 8 percent slopes. This well drained, sloping soil is on long, narrow hillsides in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 10 to 20 acres in size, but a few areas are as small as 5 acres.

Typically, the surface layer is dark grayish brown sandy loam about 6 inches thick. The upper 5 inches of the subsoil is yellowish brown sandy loam; the next 20 inches is yellowish brown sandy clay loam; the next 13 inches is brownish yellow sandy clay loam with few to common strong brown and red mottles; and the lower 26 inches is sandy clay loam mottled in shades of red, brown, and yellow. Iron concretions are common in the upper 60 inches. Common plinthite nodules make up more than 5 percent, by volume, of the lower part of the subsoil.

Included with this soil in mapping are small areas of Dothan, Esto, Fuquay, and Orangeburg soils. Also included are a few small areas where slopes are 2 to 5 percent and small areas of eroded soils. Also included are a few areas of soils that are similar to Tifton soils but that have a loamy sand surface layer. Inclusions make up less than 15 percent of any mapped area.

In this Tifton soil the water table is at a depth of more than 6 feet. Available water capacity is medium. Permeability is moderate in the subsoil. Natural fertility and organic matter content are low. Runoff is rapid where the soil is not protected, and the erosion hazard is severe.

The natural vegetation consists of longleaf and slash pine, various oaks, persimmon, and dogwood. The understory consists of native grasses and shrubs including huckleberry and blackberry. Pineland threeawn is the most common native grass.

Most areas of this soil remain in woodland. A few areas have been cleared and are used for crops.

This soil is moderately suited to a variety of crops. It is severely limited for crops by the hazard of erosion. Erosion can be reduced by contour cultivation, terraces, and stabilized waterways. A cropping sequence including close-growing crops and winter cover crops in rotation with row crops reduces erosion, as do parallel strips of perennial grasses on the contour. All crop residue should be returned to the soil. This soil responds well to fertilizer and lime.

This soil is well suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well when properly managed. They require fertilizing, liming, and control of grazing to maintain vigorous plants and good cover.

This soil has high potential for longleaf, slash, and loblolly pine. It has no serious management problems.

This soil has very high potential for dwellings without basements, shallow excavations, and local roads and streets. It has high potential for septic tank absorption fields, low commercial buildings, playgrounds, and trench sanitary landfills.

This soil is in capability subclass IIIe.

44—Troup loamy sand, 0 to 5 percent slopes. This well drained, nearly level to gently sloping soil is primarily on broad ridgetops in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 40 acres to more than 300 acres in size, but some areas are larger than 1,000 acres and some are as small as 5 acres.

Typically, the surface layer is very dark grayish brown loamy sand about 3 inches thick. The upper 18 inches of the subsurface layer is dark yellowish brown loamy sand, the next 18 inches is strong brown loamy sand, and the lower 16 inches is yellowish red sand. The subsoil is yellowish red sandy loam in the upper 5 inches and red sandy loam to a depth of more than 80 inches.

Included with this soil in mapping are small areas of Bonifay, Fuquay, Lakeland, Lucy, and Orangeburg soils. Also included are small areas where slopes are 5 to 8 percent and areas of soils that are similar to Troup soils but that have a sand surface layer. Also included are a few small areas of similar soils on Whiting Field, Naval Air Station, which have been filled or smoothed or have been stripped to a depth of 1 to 3 feet. Inclusions make up less than 15 percent of any mapped area.

In this Troup soil the water table is at a depth of more than 6 feet. Available water capacity is low in the surface and subsurface layers and medium in the subsoil. Natural fertility and organic matter content are low. Permeability is rapid in the surface and subsurface layers and moderate in the subsoil. Runoff is slow and the erosion hazard is slight.

The natural vegetation consists of longleaf and slash pine, turkey oak, blackjack oak, post oak, and a few water oak. The understory is mainly native grasses and low-growing shrubs. Pineland threeawn is the most common native grass.

Most areas of this soil remain in woodland. Many small and large areas have been cleared and are used for cultivated crops and improved pasture grasses.

This soil is moderately suited to crops. Row crop production is limited by droughtiness and susceptibility to leaching of plant nutrients. Management should increase the amount of water available in the root zone. Row crops should be rotated with close-growing, soil-improving crops and winter cover crops. All crops should be limed and fertilized. The soil-improving crops and residue of all other crops should be plowed under.

This soil is moderately suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well and produce good ground cover if they are limed and fertilized. Yields are occasionally greatly reduced by extended severe droughts. Grazing should be controlled to maintain vigorous plants and a good cover.

This soil has medium potential for longleaf, loblolly, and slash pine. Equipment limitations and seedling mortality are moderate.

This soil has very high potential for septic tank absorption fields, local roads and streets, dwellings without basements, and low commercial buildings. It has high potential for trench sanitary landfills, but the sandy overburden should be removed or suitable fill should be used as sealer and daily cover. The potential for shallow excavations and playgrounds is medium. Shallow excavations require shoring. Playgrounds need sodding or filling.

This soil is in capability subclass IIIs.

45—Troup loamy sand, 5 to 8 percent slopes. This well drained, sloping soil is on side slopes in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 30 acres to more than 100 acres in size, but a few areas are as small as 5 acres.

Typically, the surface layer is dark grayish brown loamy sand about 4 inches thick. The upper 50 inches of the subsurface layer is yellowish brown loamy sand, and the lower 6 inches is strong brown loamy sand. The subsoil is yellowish red sandy loam in the upper 6 inches and red sandy clay loam to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Bonifay, Fuquay, Lakeland, Lucy, and Orangeburg soils. Also included are areas where slopes are less than 5 percent or 8 to 12 percent, a few shallow and deep gullies, and many areas of soils that are similar to Troup soils but that have a sand surface layer. Also included are areas of poorly drained soils in and along narrow stream bottom lands and drainageways that are too small to delineate. Inclusions make up less than 15 percent of any mapped area.

In this Troup soil the water table is at a depth of more than 6 feet. Available water capacity is low in the surface and subsurface layers and medium in the subsoil. Natural fertility and organic matter content are low. Permeability is rapid in the surface and subsurface layers and moderate in the subsoil. Runoff is slow and the erosion hazard is slight.

The natural vegetation consists of longleaf and slash pine, turkey oak, blackjack oak, post oak, and a few water oak. The understory is mainly native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

Most areas of this soil remain in woodland. A few areas have been cleared and are used for cultivated crops and improved pasture grasses.

This soil is poorly suited to cultivated crops. Droughtiness and rapid leaching of plant nutrients are the main limitations for crops. Management should increase the amount of water available in the root zone. Good management includes planting row crops on the contour in alternating strips with close-growing, soil-improving crops. Alternate contour strips of perennial grasses also help control erosion. Liming and regular fertilizing are needed. All crop residue should be returned to the soil.

This soil is moderately suited to pasture grasses. Bahiagrass and Coastal bermudagrass are well suited for pasture and hay. They grow well and produce good ground cover if they are limed and fertilized. Production is occasionally greatly reduced by extended severe droughts. Grazing should be controlled to maintain vigorous plants and a good cover.

This soil has medium potential for longleaf, loblolly, and slash pine. Equipment limitations and seedling mortality are moderate.

This soil has very high potential for septic tank absorption fields, dwellings without basements, and local roads and streets. It has high potential for trench sanitary landfills and low commercial buildings. If this soil is used for trench sanitary landfills, the sandy overburden should be removed or suitable fill should be used as sealer and daily cover. Sites for low commercial buildings may need landshaping. The potential for shallow excavations and playgrounds is medium. Shallow excavations require shoring. Playgrounds need sodding or filling.

This soil is in capability subclass IVs.

46—Troup loamy sand, 8 to 12 percent slopes. This well drained, strongly sloping soil is on side slopes in the uplands. Slopes are smooth to concave. Areas of this soil range mostly from 20 acres to more than 100 acres in size, but a few areas are as small as 5 acres.

Typically, the surface layer is dark grayish brown loamy sand about 3 inches thick. The subsurface layer is loamy sand about 65 inches thick; it is yellowish brown in the upper 43 inches and strong brown in the lower 22 inches. The subsoil is yellowish red sandy loam or sandy clay loam in the upper 5 inches and red sandy loam or sandy clay loam to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Bonifay, Fuquay, Lakeland, Lucy, and Orangeburg soils. Also included are areas where slopes are 5 to 8 percent or more than 12 percent, many deep and shallow gullies, and many areas of soils that are similar to Troup soils but that have a sand surface layer. Also included are areas of poorly drained soils in and along narrow stream bottom lands and drainageways that are too small to delineate. Inclusions make up less than 17 percent of any mapped area.

In this Troup soil the water table is at a depth of more than 6 feet. Available water capacity is low in the surface and subsurface layers and medium in the subsoil. Natural fertility and organic matter content are low. Permeability is rapid in the surface and subsurface layers and moderate in the subsoil. The erosion hazard is moderate where the soil is not protected.

The natural vegetation consists of longleaf and slash pine, turkey oak, blackjack oak, and a few water oak. The understory is mainly native grasses and low growing shrubs. Pineland threeawn is the most common native grass.

Most areas of this soil remain in woodland.

This soil is not suited to cultivated crops. Steepness, low available water capacity, low inherent fertility, and susceptibility to erosion are the main limitations.

This soil is poorly suited to improved pasture grasses. Deep rooted plants such as bahiagrass and Coastal bermudagrass are well suited for pasture, but periodic droughts reduce production. Soil blowing and water erosion are hazards on newly seeded pastures. Grazing should be carefully controlled. Regular liming and fertilizing are needed.

This soil has medium potential for longleaf, loblolly, and slash pine. Equipment limitations and seedling mortality are moderate.

This soil has very high potential for local roads and streets. It has high potential for septic tank absorption fields, trench sanitary landfills, dwellings without basements, and low commercial buildings. Septic absorption lines should be laid across the slope. Sites for dwellings without basements and low commercial buildings may need landshaping. This soil has low potential for shallow excavations and playgrounds. Shoring is required for shallow excavations. Playgrounds need filling, paving, or sodding.

This soil is in capability subclass VIs.

47—Troup-Orangeburg-Cowarts complex, 5 to 12 percent slopes. This complex consists of sloping to strongly sloping, well drained soils on side slopes. Slopes are smooth to concave. The areas of the individual soils are so intermixed that they could not be separated in mapping. The individual areas range from 1 to 15 acres in size. Mapped areas of this complex range from 5 to 200 acres.

This complex is 30 to 45 percent Troup loamy sand, 15 to 25 percent Orangeburg sandy loam, 10 to 20 percent Cowarts loamy fine sand, and 10 to 45 percent minor soils.

The Troup soil has slopes of 5 to 12 percent. Typically, the surface layer is yellowish brown loamy sand about 2 inches thick. The subsurface layer is loamy sand 50 inches thick; the upper 19 inches is brownish yellow, the next 20 inches is yellowish red, and the lower 11 inches is red. The subsoil is red sandy loam and extends to a depth of 80 inches or more.

The Troup soil has slow runoff, and the erosion hazard is moderate in unprotected areas. Natural fertility and organic matter content are low. Permeability is rapid above a depth of 52 inches and moderate below this depth. Available water capacity is low in the surface and subsurface layer and medium in the subsoil. The water table is below a depth of 72 inches.

The Orangeburg soil has slopes of 5 to 12 percent. Typically, the surface layer is dark brown sandy loam about 6 inches thick. The subsoil is sandy clay loam and extends to a depth of more than 80 inches; the upper 49 inches is red, and the lower 25 inches is mottled brown, red, yellow, and gray.

The Orangeburg soil has rapid to very rapid runoff in unprotected areas, and the erosion hazard is severe to very severe. Natural fertility and organic matter content are low. Permeability is moderately rapid above a depth of 6 inches and moderate below this depth. Available water capacity is medium. The water table is below a depth of 72 inches throughout the year.

The Cowarts soil is mainly where slopes are 8 to 12 percent. Typically, the surface layer is loamy fine sand about 6 inches thick. The upper 3 inches is dark grayish brown, and the lower 3 inches is dark brown. The upper 3 inches of the subsoil is yellowish brown fine sandy loam, and the lower 14 inches is strong brown sandy clay loam. Below a depth of 23 inches is mottled sandy clay loam with pockets of coarser and finer textured material.

The Cowarts soil has rapid to very rapid runoff in unprotected areas, and the erosion hazard is severe to very severe. Natural fertility and organic matter content are low. Permeability is moderately rapid above a depth of 9 inches, moderate between depths of 9 and 23 inches, and slow to moderately slow below a depth of 23 inches. Available water capacity is medium. A water table is perched for short periods at a depth of about 2 to 3 feet.

Dothan soils make up about 10 percent of the map unit; they are mainly where slopes are 5 to 8 percent. Other minor soils are Albany, Esto, Fuquay, Lucy, and Lakeland soils. Small, seepy wet spots also occur in a few mapped areas of this complex. Small areas of poorly drained soils in and along narrow stream bottoms and drainageways are shown by drainage symbols. A few areas of soils that have slopes of 12 to 25 percent are included; these areas are relatively small and narrow and occur mainly on the lower part of the mapped areas. These areas are mostly Troup and Lakeland soils and soils similar to Esto and Orangeburg soils. These soils are associated with shallow or deep gullies in many places.

The natural vegetation consists of slash and longleaf pine, dogwood, red oak, water oak, laurel oak, blackjack oak, turkey oak, hickory, magnolia, sweetgum, bay, and holly. The understory consists mainly of shrubs, wiregrass, grassleaf goldaster, ferns and other grasses.

Most areas of these soils remain in native vegetation.

This complex is poorly suited to cultivated crops. Steepness and susceptibility to erosion are the main limitations. If crops are grown, erosion can be reduced by constructing terraces and grassed waterways, stripcropping on the contour, and maintaining a close-growing cover crop when no cultivated crops are being grown.

This complex is moderately suited to improved pasture. Bahiagrass and Coastal bermudagrass are suitable, but soil blowing and erosion are hazards on newly seeded pastures. Grazing should be controlled. Regular liming and fertilizing are needed.

The potential of this complex for pine is medium. Selectively cutting and reestablishing a proper cover crop protect the soil from erosion. The hardwoods found on these soils have little economic value and therefore are not managed.

The soils in this complex have variable potential for urban uses. The potential depends upon the slope and on the kind of soil at a site. An investigation of each area is needed to determine the potential for any use. Slope is the main limitation in some areas. Operation of sanitary facilities may be a problem in a few areas because of seepage downslope. Septic absorption lines should be laid across the slope. Landshaping may be necessary in some areas for dwellings without basements, low commercial buildings, and playgrounds. Shoring is needed in shallow excavations in the sandy soils.

These soils are in capability subclass VIs.

48—Urban land. Urban land consists of areas that are more than 85 percent covered by streets, parking lots, airports, runways, pavement, and buildings and other structures. This land is so altered or obscured by urban works and structures that identification of soils is not feasible. The original soil in some areas has been modified by grading, filling, and shaping. Urban land is mainly nearly level to gently sloping. Slopes range from 0 to 5 percent. Individual mapped areas range from about 40 to 150 acres in size.

In uncovered areas where the soils are identifiable they are primarily Troup, Lakeland, Fuquay, and Lucy soils. These soils are included in mapping because their areas are too small to delineate separately.

Urban land is most likely to remain in its present use. Therefore, no interpretations, limitations, or ratings of potential are given for other uses. Any other use of these areas should be evaluated after onsite investigation.

Urban land is not placed in a capability class.

Use and management of the soils

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

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

Information in this section can be used to plan the use and management of soils for crops and pasture; as ran-

geland and woodland; as parks and other recreation facilities; for wildlife habitat; and as sites for buildings, sanitary facilities, highways and other transportation systems. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

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

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

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

Crops and pasture

John D. Griffin, agronomist, 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, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are 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 "Soil maps for detailed planning." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

More than 90,000 acres in Santa Rosa County was used for crops and pasture in 1975. Of this, 17,577 acres was used for permanent pasture; 69,702 acres for row crops, mainly soybeans; 3,000 acres for close-grown crops, mainly wheat and oats; and the rest for cotton, peanuts, corn, truck crops, and other crops.

The potential of the soils in Santa Rosa County for increased production of food is good. About 270,000 acres of potentially good cropland is currently used as woodland and about 17,000 acres as pasture. In addition to the reserve productive capacity represented by this land, food production could also be increased considerably by extending the latest crop production technology to all cropland in the county. This soil survey can greatly facilitate the application of such technology.

Field crops suited to the soils and climate of the survey area include many that are not now commonly grown. Soybeans, cotton, corn, and peanuts are the common row crops. Grain sorghum, sunflowers, potatoes, and similar crops could also be grown.

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

Special crops grown commercially in Santa Rosa County are vegetables and pecans. A small acreage throughout the county is used for melons, sweet corn, tomatoes, greens, and other vegetables. In addition, large areas could be used for other special crops such as blueberries, strawberries, grapes, plums, and peaches.

Deep soils that have good natural drainage and that warm up early in spring are especially well suited to many vegetables and small fruits. In the survey area these are Dothan, Orangeburg, Red Bay, and Tifton soils that have slopes of less than 5 percent. These soils cover about 60,000 acres. Also, if irrigated, the Bonifay, Lakeland, and Troup soils that have slopes of less than 5 percent are very well suited to vegetables and small fruits. Crops can generally be planted and harvested earlier on these soils than on the other soils in the county.

Most of the well drained soils in the survey area are suitable for orchards and nurseries. Soils in low positions where frost is frequent and air drainage is poor, however, generally are poorly suited to early vegetables, small fruits, and orchards.

Latest information and suggestions for growing special crops is available from local offices of the Cooperative Extension Service and the Soil Conservation Service.

In general, the soils that are well suited to crops are also well suited to urban development. The acreage in crops and pasture has remained constant, but forested land is being used for urban development. In 1975 about 9,200 acres of the county was urban and built-up land. Each year approximately another 1,000 acres is developed for urban uses in Jay, Pace, Milton, and other towns in Santa Rosa County. Much of this land was well suited to crops. Data about specific soils in this publication can be used in planning future land use.

Management concerns

Soil erosion is the major soil problem on about one-fourth of the cropland and pasture in Santa Rosa County. If slope is more than 2 percent, water erosion is a hazard. Dothan, Orangeburg, and Red Bay soils, for example, have slopes of 2 to 5 percent. Dothan soils have the additional problem of a perched water table. Wind erosion is a hazard on soils such as Bonifay, Lakeland, Lucy, and Troup soils when they are dry, bare, and not sheltered from strong winds. Wind erosion also damages tender crops.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Second, soil erosion on farmland results in sediment entering streams. Control of erosion minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation, and for fish and wildlife.

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

Minimizing tillage and leaving crop residue on the surface increase infiltration and reduce runoff and erosion. These practices can be adapted to most soils in the survey area but are more difficult to use successfully on eroded soils. No-tillage for corn and soybeans also reduces erosion on sloping land.

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

Contouring is a widespread erosion control practice in Santa Rosa County. It is most suitable on soils that have smooth, uniform slopes, including most areas of the sloping Dothan, Fuquay, Lucy, Orangeburg, Red Bay, and Tifton soils.

Wind erosion is a hazard on the sandy Bonifay, Lakeland, and Troup soils. Strong winds can damage these soils in a few hours if the soils are dry and bare of vegetation or surface mulch. Maintaining plant cover and surface mulch minimizes wind erosion on these soils. Windbreaks of adapted shrubs and trees, such as laurelcherry and slash pine, are also effective in reducing wind erosion, as are strips of small grain.

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

Soil drainage is the major management need on some of the acreage used for crops and pasture in the survey area. Some soils are naturally so wet that the production of common crops is generally not possible. These are the poorly drained and very poorly drained soils.

Unless artificially drained, the somewhat poorly drained soils are so wet that crops are damaged during most years. Albany, Escambia, and Lynchburg soils are somewhat poorly drained.

Albany and Pactolus soils have good natural drainage most of the year, but they tend to dry out slowly after rains. Small areas of wetter soils along drainageways and in swales are commonly included in areas of the moderately well drained soils, especially those that have slopes of 2 to 5 percent. Artificial drainage is needed in some of these wetter areas.

The design of surface drainage systems varies with the kind of soil. Surface drainage is needed in most areas of the poorly drained and somewhat poorly drained soils that are used intensively for row crops. Drains have to be more closely spaced in soils with slow permeability than in the more permeable soils.

Soil fertility is naturally low in most soils of the uplands in Santa Rosa County. All upland soils are naturally acid. The soils on the flood plains, such as Bibb, Chewacla, Lenoir, and Riverview soils, range from very strongly acid to mildly alkaline and are naturally higher in plant nutrients than most upland soils.

Many upland soils are naturally very strongly acid. If they have never been limed, these soils require applications of ground limestone to raise the pH sufficiently for good growth of crops that grow only on nearly neutral soils. Available phosphorous and potassium levels are naturally low in most of these soils. On all soils, additions of lime and fertilizer should be based on the results of soil tests, on the needs of the crop, and on the expected level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to apply.

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

Most of the soils used for crops in Santa Rosa County have a loamy fine sand or sandy loam surface layer that is light in color and low in content of organic matter. Generally such soils have poor tilth. Regular additions of crop residue, manure, and other organic material can help improve tilth.

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 4. 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 4 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils.

Land capability classification

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

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

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

Class I soils have slight limitations that restrict their use.

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

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

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

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

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

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

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

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

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

The acreage of soils in each capability class and subclass is shown in table 5. The capability classification of each map unit is given in the section "Soil maps for detailed planning."

Woodland management and productivity

Carl D. Defazio, forester, Soil Conservation Service, helped prepare this section.

Santa Rosa County has approximately 493,000 acres of woodland, which is about 76 percent of the county. Most of the woodland is owned by corporations, the State of Florida, and the United States. The soils and climate of Santa Rosa County are good for growing timber. Most of the forest is on Bonifay, Dothan, Fuquay, Lakeland, Lucy, Orangeburg, and Troup soils. The woodland is concentrated in the eastern, southern, and extreme western parts of the county.

Slash and longleaf pine are the main species. There are also appreciable amounts of loblolly, sand, and shortleaf pine. The pines grow mostly on the uplands. Many hardwood species, such as sweetgum, blackgum, yellow-poplar, hickory, maple, and baldcypress, grow mainly along the Yellow, Blackwater, and Escambia Rivers. Turkey, post, blackjack, and bluejack oak grow on the southeast sandhills; these species are of little economic value, although they are valuable for wildlife food.

Most of the woodland is owned by large corporations, which manage it intensively. Even-aged management—consisting of thinning, clearcutting, site preparation, and planting—is extensively practiced. Public lands in the State forest are managed by using more selective cutting techniques and by depending on natural seeding to regenerate the area with native pine species. Prescribed

burning reduces the understory and exposes mineral soil as a seedbed. It also reduces incidence of destructive wildfire and encourages grasses and forbs that help support wildlife such as deer, turkey, and quail.

Markets for the wood of Santa Rosa County are plentiful. Pulpwood mills are the major outlets. Other markets for lumber, veneer, posts, and poles are available. The value of the wood products is substantial, but it could be higher if all woodlands were managed for the greatest production. Other values of woodland include grazing, wildlife, recreation, natural beauty, and conservation of soil and water.

More detailed information on woodland and woodland management can be obtained from the local offices of the Soil Conservation Service, the Florida Division of Forestry, and the Cooperative Extension Service.

Table 6 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *w* indicates excessive water in or on the soil; *c*, clay in the upper part of the soil; *s*, sandy texture; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: w, c, s, and r.

In table 6, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

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

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

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

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

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

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

Windbreaks and environmental plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, hold snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To insure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension Service or from a nursery.

Recreation

Recreational opportunities in Santa Rosa County are excellent. The many rivers and streams and the Gulf of Mexico provide good swimming, boating, and fishing, in either fresh or salt water. Part of Blackwater River State Forest, consisting of approximately 120,000 acres, is in the northeastern part of the county (fig. 9). Besides swimming and fishing, the forest has hunting, nature lore, hiking trails, picnic areas, camping, horseback riding trails and stables, a State park, a fish hatchery, and canoeing. A canoeist on Coldwater Creek, Blackwater River, or Sweetwater-Juniper Creeks can wander through some of the finest natural beauty in the panhandle. Eglin Air Force Base, along with the State Forest, provides hunting on approximately 170,000 acres.

The soils of the survey area are rated in table 7 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 7, 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

Figure 9.—Camping facility in Blackwater River State Forest. Soil is Troup loamy sand, 0 to 5 percent slopes.

maintenance, limited use, or by a combination of these measures.

The information in table 7 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 10 and interpretations for dwellings without basements and for local roads and streets in table 9.

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

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

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. Grading is needed in some areas.

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

Wildlife habitat

John F. Vance, Jr., biologist, Soil Conservation Service, helped prepare this section.

Santa Rosa County has a variety of soils that provide various wildlife habitats. Many species of birds, mammals, reptiles, and fish live throughout the county. Wildlife include whitetailed deer, bobwhite quail, gray and fox squirrel, mourning dove, and wild turkey, as well as many different wading birds, woodpeckers, raptors, songbirds, and small mammals. The most extensive areas for wildlife are on Eglin Air Force Base and in the Blackwater River State Forest. Urban and built-up areas have reduced wildlife habitat in many parts of the county.

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

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

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

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

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, lespedezas, and hairy indigo.

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

wild grape, honeysuckle, beggarweed, saw briers, blackberry, and ragweed.

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, wild cherry, dogwood, hickory, and blueberry.

Coniferous plants furnish browse, seeds, and cones. 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 maidencane, titi, pickerelweed, sedges, and bay.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

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

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, pheasant, 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, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

Jesse T. Wilson, civil engineer, Soil Conservation Service, helped prepare this section.

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

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

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

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

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

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

If vegetation is removed from a site during construction, the soils have a hazard of erosion. Water erosion is a hazard during periods of heavy rainfall, and wind ero-

sion is often a hazard during extended dry periods. Only as much vegetation as is necessary for construction should be removed. Storm drains and utility lines should be installed before the site is cleared. Such temporary measures as diversions, sediment basins, and temporary seeding of adapted plants and mulching are needed to control erosion during construction. After final site grading, vegetation should be established as soon as possible. Latest information and suggestions for vegetative treatment of urban sites is available from local offices of the Soil Conservation Service and the Cooperative Extension Service and from local nurserymen.

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 9 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, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to a cemented pan, 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 cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Sanitary facilities

Table 10 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 10 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

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

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

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

Table 10 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, 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 cemented pans 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 10 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

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

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

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegation. 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 11 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 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 11, 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 properties.

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

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

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

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

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

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

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

Water management

Table 12 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, 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 permeable material. Excessive slope can affect the storage capacity of the reservoir area.

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

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

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable com-

paction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

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

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

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 or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to a cemented pan 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 or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil properties

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

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 18.

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

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

Engineering properties

Table 13 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 morphology."

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

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

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

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

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 18.

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

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

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

Physical and chemical properties

Table 14 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.

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

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown 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.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

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

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

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The

change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

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

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

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion and the amount of soil lost. Soils are grouped according to the following distinctions:

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.
5. Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.
6. Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.
7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.
8. Stony or gravelly soils and other soils not subject to wind erosion.

Soil and water features

Table 15 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

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

The four hydrologic soil groups are:

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

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

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

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

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

Table 15 gives the frequency and duration of flooding and the time of year when flooding is most likely.

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

May, for example, means that flooding can occur during the period November through May.

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

Also considered is 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 15 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 15.

Water table studies were made from 1974 to 1977 on selected soils in Santa Rosa County. Perforated pipes were placed in the soils and depth to water in the pipes was recorded at the first and the middle of each month. The average of the two readings is recorded in table 16. Rainfall was also measured at the sites and is shown in table 17.

An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An artesian water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. 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.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is more than 5 feet in all soils in Santa Rosa County. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

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

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

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

Engineering test data

Table 18 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 morphology." The soil samples were tested by the Soils Laboratory, Florida Department of Transportation, Bureau of Materials and Research.

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), D2217 (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).

Physical, chemical, and mineralogical analyses of selected soils

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Physical, chemical, and mineralogical properties of representative pedons sampled in Santa Rosa County are presented in tables 19, 20, and 21. Analyses were conducted and coordinated by the Soil Characterization Laboratory, Soil Science Department, University of Florida. Most analytical methods used are outlined in Soil Survey Investigations Report No. 1 (*8*). Detailed profile descriptions of the soils analyzed are given in the section "Soil series and morphology." Laboratory data and profile information for other soils in Santa Rosa County

as well as for soils in other counties in Florida are on file at the Soil Science Department, University of Florida.

Soils were sampled by horizon from pits at carefully selected locations that represent typifying pedons. Samples were air-dried, crushed, and sieved through a 2-millimeter screen.

Particle size distribution was determined by using a modification of the Bouyoucos hydrometer procedure (*3*) with sodium hexametaphosphate as the dispersant. Hydraulic conductivity, bulk density, and water content tests were performed on undisturbed core samples. Organic carbon was determined by a modification of the Walkley-Black wet combustion method. Extractable bases were obtained by equilibrating and leaching soils with ammonium acetate buffered at pH 7.0. Sodium and potassium in the extract were determined by flame photometry, and calcium and magnesium by atomic absorption spectroscopy. Extractable acidity was determined by the barium chloride-triethanolamine method at pH 8.2. Sum of cations, which may be considered a measure of the cation exchange capacity, was obtained by summation of extractable bases and extractable acidity. Base saturation is the ratio of extractable bases to sum of cations expressed as a percentage. Reaction was measured with a glass electrode using water in a 1:1 soil-solution ratio; using 0.01*M* calcium chloride solution in a 1:2 soil-solution ratio; and using 1*N* potassium chloride solution in a 1:1 soil-solution ratio. Electrical conductivity determinations were made with a conductivity bridge on 1:1 soil-water mixtures. Iron and aluminum extractable in sodium dithionite-citrate were determined by atomic absorption. Aluminum, carbon, and iron were extracted from suspected spodic horizons with 0.1*M* sodium pyrophosphate; determinations of aluminum and iron were by atomic absorption, and determinations of extracted carbon were by the Walkley-Black wet combustion method.

Peak heights at positions of 18, 14, 7.2, 4.83, and 4.31 angstroms represent montmorillonite and interstratified expandibles, vermiculite and a 14-angstrom intergrade mineral, kaolinite, gibbsite, and quartz. These peak heights were measured, summed, and normalized to give percentages of the soil minerals identified in X-ray diffractograms. These values are not absolute quantities, but show the relative distribution of minerals in the clay fraction. Determining the absolute quantity of a mineral requires additional knowledge of particle size, crystallinity, unit structure substitution, and matrix effects.

Generally, the soils have more clay in the B horizon than in the overlying A horizon (table 19), which indicates the presence of an argillic horizon in the subsoil. Exceptions are the Bohicket, Dorovan, Kureb, Lakeland, Leon, Pactolus, and Rutlege soils. If clay content increases with depth, silt content and especially sand content correspondingly decrease. All of the pedons except those of the Angie Variant, Bohicket, Escambia, Esto, Lynchburg, Red Bay, and Tifton soils are more than 70 percent sand in the A horizon. The Kureb and Leon pedons are more than 90 percent sand in this horizon. Four soils—Angie Variant, Escambia, Esto, and Lynchburg—have relatively high quantities of silt. No soil tested is more than 20 percent very coarse plus coarse sand, which indicates that the sand is relatively fine.

Hydraulic conductivity data (table 19) measure the movement of water through the soil when the soil is saturated. Generally, hydraulic conductivity decreases with increasing clay and silt content and increasing bulk density and increases with increasing organic matter content and better developed structure. In the tested soils, clay, clay loam, and sandy clay textures show hydraulic conductivity of less than 1.0 centimeter per hour and in many cases of less than 0.1 centimeter per hour. Sand and loamy sand show hydraulic conductivity between 1.8 and 292 centimeters per hour; the average is about 20 centimeters per hour. Intermediate textures show intermediate hydraulic conductivity.

Available water holding capacity of soils can be estimated from bulk density and water content (table 19). Generally, sand and loamy sand horizons retain less available water than do horizons of sandy loam, sandy clay loam, sandy clay, and clay texture. In the upper 1 meter, the amount of water available to plants ranges from about 2 centimeters in the Kureb and Leon soils, which are the coarsest soils for which water data are available, to more than 7 centimeters in the Angie Variant, Garcon, Kalmia, Lynchburg, and Rutlege soils, which contain significant amounts of silt and clay in the upper 1 meter. Other pedons on which data are available are intermediate.

Low values for extractable bases, sum of cations, and base saturation (table 20) indicate low inherent soil fertility. Calcium and magnesium are the predominant bases; the largest amounts of these elements occur in Bohicket and Dorovan soils. Sodium content is low in almost all soils except the Bohicket soil. Trace amounts of potassium coupled with low base saturation indicate the absence of appreciable quantities of weatherable minerals in these soils. The sum of cations reflects the amount of organic matter and clay and the type of clay present. The sum of cations increases with an increase of organic matter and clay. Therefore, the sum of cations generally is relative high in the surface horizon and decreases with depth to the top of the argillic horizon, where it again increases.

Organic carbon content (table 20) is greatest in the upper horizon of all soils, except the Dorovan soil, and decreases with depth. The increase of organic carbon below a depth of 1 meter in the Kureb and Leon soils indicates illuviated humus. Since organic carbon directly influences nutrient- and water-retention capacities, management that conserves and maintains organic carbon is desirable and is especially important on the soils with little organic carbon and clay, such as the Kureb, Lakeland, and Leon soils.

Electrical conductivity (table 20) reflects the amount of free salts in the soil. If high, it indicates conditions that may adversely affect plant growth; only the Bohicket soil exhibited conductivity sufficiently high to indicate a hazard. Further, the Bohicket soil contains more than 2 percent sulfur throughout the pedon, indicating potential problems if drainage is improved.

The pH determinations (table 20) reflect the active acidity of the soils. In general, nutrient availability is greatest in soil when reaction in water is between pH 6 and 7. Lime is commonly added to the soil to raise the pH of the plow layer. No pedon sampled had reaction in water higher than pH 6.0. Soil reaction in calcium chloride and in potassium chloride is generally 0.5 to 1.5 pH units lower than in water.

The amount of extractable iron and aluminum (by dithionite-citrate) are associated with the ability of a soil to absorb phosphorus and in time render it unavailable to plants (table 20). Notably, the Angie Variant, Dothan, Escambia, Esto, Orangeburg, Pactolus, Tifton, and Red Bay soils have large amounts of extractable iron or aluminum near the surface.

Mineralogy of the crystalline components of the clay fraction is reported in table 21 for selected horizons of the sampled pedons. In general, the clay mineralogical suite is composed of montmorillonite, a 14-angstrom intergrade mineral, kaolinite, gibbsite, and quartz. Vermiculite was not found, and mica (illite) was found only in the Esto, Lynchburg, Maxton, Mulat, and Tifton soils. Montmorillonite and gibbsite did not occur together in any soil. Montmorillonite shrinks and swells with changes in water content; if present in large quantities in a soil, it dictates that care be exercised in using the soil for any engineering purpose.

Kaolinite, quartz, and the 14-angstrom intergrade mineral are present in all pedons. Generally, the quantities of quartz and of the 14-angstrom intergrade mineral decrease with depth, and the quantity of kaolinite increases. This tendency suggests that the 14-angstrom intergrade mineral is more stable than kaolinite in the acidic weathering environment near the surface and that quartz in the clay fraction is the result of decrement of silt-sized quartz.

Classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*9*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 22, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

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

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

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

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

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

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

Soil series and 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 (*7*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*9*). 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 "Soil maps for detailed planning."

Albany series

Soils of the Albany series are loamy, siliceous, thermic grossarenic Paleudults. They are nearly level to gently sloping and are somewhat poorly drained. They formed in thick beds of sandy and loamy marine sediments. These soils are in small areas on low uplands. Slopes range from 0 to 5 percent.

Albany soils are near Bonifay, Lakeland, Lynchburg, Pactolus, and Troup soils. Bonifay soils are well drained and have horizons containing more than 5 percent plinthite above a depth of 60 inches. Lakeland soils do not have a Bt horizon and are excessively drained. Lynchburg soils have a Bt horizon above a depth of 20 inches. Pactolus soils do not have a Bt horizon. Troup soils are better drained and have a red to strong brown Bt horizon below a depth of 40 inches.

Typical pedon of Albany loamy sand, 0 to 5 percent slopes, in a wooded area approximately 20 yards west of paved road, NE1/4SE1/4 sec. 7, T. 2 N., R. 28 W.:

A1—0 to 5 inches; very dark gray (10YR 3/1) loamy sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.

A21—5 to 17 inches; brown (10YR 5/3) loamy sand; common fine distinct yellowish brown (10YR 5/6) root stains; single grain; loose; common fine and medium roots; very strongly acid; gradual smooth boundary.

A22—17 to 25 inches; light olive brown (2.5Y 5/4) loamy sand; few medium distinct light brownish gray (10YR 6/2) and common medium distinct yellowish brown (10YR 5/6) and pale brown (10YR 6/3) mottles; single grain; loose; few fine and medium roots; very strongly acid; gradual smooth boundary.

A23—25 to 47 inches; yellowish brown (10YR 5/6) loamy sand; few fine faint strong brown mottles; single grain; loose; few medium roots; very strongly acid; gradual wavy boundary.

B1—47 to 52 inches; yellowish brown (10YR 5/6) sandy loam; few fine faint strong brown and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual smooth boundary.

B21t—52 to 67 inches; mottled light gray (10YR 7/2), yellowish brown (10YR 5/6), brownish yellow (10YR 6/8), pale brown (10YR 6/3), strong brown (7.5YR 5/8) light reddish brown (5YR 6/4), and red (2.5YR 4/8) sandy loam; moderate medium subangular blocky structure; friable; very strongly acid; gradual smooth boundary.

B22t—67 to 80 inches; mottled yellowish brown (10YR 5/8), brownish yellow (10YR 6/8), white (10YR 8/2), strong brown (7.5YR 5/8), red (10R 4/8), and pale red (10R 6/4) sandy loam; weak medium subangular blocky structure; friable to firm; strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid in all horizons except the A horizon where the soil has been limed.

The A1 or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2; hue of 2.5Y, value of 3 to 5, and chroma of 2; or is neutral and has value of 3 to 5 and chroma of 0. It ranges from 4 to 9 inches in thickness. The A2 horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 2 to 8. The A2 horizon has few to common, faint to distinct mottles of gray, yellow, and brown. The A2 horizon ranges from 36 to 54 inches in thickness. Texture ranges from sand to loamy sand.

The B1 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6. It ranges from 4 to 9 inches in thickness. This horizon has few to common mottles in shades of gray, yellow, brown, and red.

The B2t horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 8. This horizon has common to many distinct mottles of gray, yellow, brown, and red. In some areas the B2t horizon lacks a dominant color and is mottled in shades of gray, yellow, brown, and red. Texture of the B2t horizon ranges from sandy loam to sandy clay loam.

Angie Variant

Soils of the Angie Variant are clayey, mixed, thermic Aquic Paleudults. They are nearly level, moderately well drained, sandy soils that have a loamy subsoil. They formed in loamy marine sediments. These soils are on broad flats between streams and along drainageways. Slopes are less than 2 percent.

Angie Variant soils are near Escambia, Fuquay, Johns, Kalmia, and Lynchburg soils. All of those soils have less than 35 percent clay in the argillic horizon. Fuquay and Kalmia soils do not have mottles above a depth of 30 inches. Escambia and Lynchburg soils are somewhat poorly drained.

Typical pedon of Angie Variant loam, approximately 0.25 mile east of Delaney Creek and 30 yards south of trail road, SW1/4SW1/4 sec. 20, T. 3 N., R. 30 W.:

A1—0 to 4 inches; very dark gray (10YR 3/1) loam; weak fine granular structure; very friable; many fine and few medium roots; extremely acid; clear smooth boundary.

B1—4 to 7 inches; light olive brown (2.5Y 5/4) loam; weak medium subangular blocky structure; friable; many fine and few medium roots; very strongly acid; gradual smooth boundary.

B21t—7 to 11 inches; brownish yellow (10YR 6/6) clay loam; few fine faint strong brown mottles; weak medium subangular blocky structure; friable; common fine and few medium roots; very strongly acid; gradual smooth boundary.

B22t—11 to 25 inches; brownish yellow (10YR 6/6) clay; common medium distinct red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; friable; few fine and medium roots; very strongly acid; gradual smooth boundary.

B23t—25 to 39 inches; mottled brownish yellow (10YR 6/6), gray (10YR 6/1), pale brown (10YR 6/3), strong brown (7.5YR 5/8), and red (2.5YR 4/8) sandy clay loam; moderate medium subangular blocky structure; friable; few fine and medium roots; strongly acid; gradual smooth boundary.

B24tg—39 to 52 inches; gray (10YR 6/1) clay; common medium prominent strong brown (7.5YR 5/8) and red (2.5YR 4/8) mottles and few fine distinct brownish yellow mottles; moderate medium subangular blocky structure; friable; few fine roots; very strongly acid; gradual smooth boundary.

B25tg—52 to 76 inches; light gray (10YR 7/1) clay; few medium prominent red (2.5YR 4/8), common medium prominent strong brown (7.5YR 5/8), and common fine distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; friable; very strongly acid.

The solum is more than 60 inches thick. Reaction is extremely acid to strongly acid throughout the profile except in the A horizon where the soil has been limed.

The A1 or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. It is 4 to 8 inches thick. The A2 horizon, where present, has hue of 2.5Y, value of 5 or 6, and chroma of 4; or hue of 10YR, value of 5, and chroma of 3 or 4. The A horizon ranges from 4 to 16 inches in thickness.

The B1 horizon has hue of 10YR, value of 6, and chroma of 6 or hue of 2.5Y, value of 5 or 6, and chroma of 4. Texture is sandy loam or loam. Thickness ranges from 3 to 5 inches.

The B21t and B22t horizons have hue of 10YR, value of 5 or 6, and chroma of 4 to 8 with mottles in shades of yellow, brown, gray, and red. The B23t horizon is mottled in shades of gray, yellow, brown, and red; gray increases with depth. The B21t, B22t and B23t horizons are sandy clay loam, clay, sandy clay, or clay loam. The B24tg and B25tg horizons have hue of 10YR, value of 6 or 7, and chroma of 1. These horizons have mottles in shades of yellow, brown, and red. Texture is clay or clay loam. Weighted average clay content of the Bt horizon ranges from 35 to 55 percent. Silt content ranges from 15 to 30 percent.

Bibb series

Soils of the Bibb series are coarse-loamy, siliceous, acid, thermic Typic Fluvaquents. These soils are nearly level and poorly drained. They formed in loamy and sandy fluvial sediments. These soils are on flood plains along streams and are subject to frequent flooding. Slopes range from 0 to 2 percent.

Bibb soils are near Dorovan, Escambia, Johns, Kalmia, Kinston, Pactolus, Pamlico, and Rutlege soils. Dorovan and Pamlico soils are on flood plains and in depressions, are very poorly drained, and are organic. Escambia soils are along drainageways, around depressions, and on low flats between streams; they are somewhat poorly drained and have more than 5 percent plinthite above a depth of 60 inches. Johns soils are on stream terraces, primarily along the larger streams; they are somewhat poorly drained to moderately well drained and have a Bt horizon that is more than 18 percent clay in the upper 20 inches. Kalmia soils are on stream terraces, primarily along the larger streams in the county; they are well drained and have a Bt horizon that is more than 18 percent clay in the upper 20 inches. Kinston soils are on flood plains and have more than 18 percent clay in the 20- to 40-inch control section. Nearly level to gently sloping Pactolus soils are in low positions in the uplands; they are moderately well drained to somewhat poorly drained. Nearly level Rutlege soils are in low, flat depressions and in ponded areas; they have an umbric epipedon and are sandy throughout.

Bibb soils are mapped only in association with Kinston soils.

Typical pedon of Bibb silt loam from a wooded area of Bibb-Kinston association, approximately 5.25 miles west of Munson, approximately 160 yards north of State Highway 4, and 75 yards west of Coldwater Creek, SE1/4NE1/4 sec. 5, T. 4 N., R. 27 W.:

A11—0 to 6 inches; very dark gray (10YR 3/1) silt loam; moderate medium granular structure; friable; many fine and medium roots; very strongly acid; gradual wavy boundary.

A12—6 to 17 inches; dark gray (10YR 4/1) silt loam; common medium distinct gray (10YR 6/1) mottles; weak fine granular structure; friable; many fine and medium roots; very strongly acid; gradual wavy boundary.

C1g—17 to 42 inches; gray (10YR 5/1) silt loam; common medium faint gray (10YR 6/1) and few medium distinct yellowish brown (10YR 5/8) mottles;

few thin strata of fine sand in lower part; massive; friable; very strongly acid; clear wavy boundary.

C2g—42 to 60 inches; light brownish gray (10YR 6/2) fine sand; few thin streaks of silt loam and loamy fine sand; few medium distinct light gray (10YR 7/1) mottles; massive; very friable; very strongly acid; gradual wavy boundary.

C3g—60 to 65 inches; light brownish gray (10YR 6/2) fine sand; few fine distinct light gray (10YR 7/1) and light yellowish brown (10YR 6/4) mottles; single grain; loose; very strongly acid.

Reaction is strongly acid or very strongly acid in all horizons. The weighted average clay content of the 10- to-40-inch control section is less than 18 percent. The content of small quartz pebbles ranges from 0 to 5 percent by volume in the lower part of a few pedons.

The A11 horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It ranges from 3 to 6 inches in thickness. The A12 horizon has hue of 10YR, value of 3 to 7, and chroma of 2 or less. It ranges from 5 to 14 inches in thickness.

The C horizon has hue of 10YR and 2.5Y, value of 4 to 7, and chroma of 2 or less. It has few to many mottles in shades of gray, brown, and yellow. In a few pedons the C horizon is mottled in shades of gray, yellow, and brown. The C horizon is silt loam, loam, sandy loam, loamy fine sand, loamy sand, or sand, or it is stratified.

Bohicket series

Soils of the Bohicket series are fine, mixed, nonacid, thermic Typic Sulfaquents. These soils are level and very poorly drained. They formed in silty and clayey marine and stream sediments under conditions favorable for the accumulation of organic matter. These soils are in the tidal marshes of the Gulf Coastal flatwoods. Slopes are generally less than 1 percent.

Bohicket soils are near Bibb, Chewacla, Dorovan, Handsboro, Kinston, Wahee, and Pamlico soils. Bibb soils are on flood plains and have less than 18 percent clay in the 10- to 40-inch control section. Chewacla and Wahee soils are on higher elevations and on flood plains along streams; they are somewhat poorly drained and contain less than 35 percent clay. Dorovan and Pamlico soils are organic and are low in content of salt and sulfur. Handsboro soils are organic. Kinston soils are on flood plains; they are poorly drained and are 18 to 35 percent clay in the 20- to 40-inch control section.

Bohicket soils are mapped only with Handsboro soils.

Typical pedon of Bohicket clay in an area of Bohicket and Handsboro soils in tidal marsh, approximately 100 yards east of U.S. Highway 90 and 125 yards west of the junction of Escambia and East Rivers, sec. 32, T. 1 N., R. 29 W.:

A1g—0 to 15 inches; very dark grayish brown (2.5Y 3/2) clay; massive; slightly sticky; when squeezed in hand, soil flows easily between fingers (estimated n value more than 1); apparent sulphide odor; matted with live and dead grass roots; about 24 percent organic matter (estimated); moderately alkaline; gradual smooth boundary.

C1g—15 to 45 inches; dark olive gray (5Y 3/2) silty clay; massive; slightly sticky; when squeezed in hand, soil flows easily between fingers (estimated n value more than 1); sulphide odor present; common live and dead grass roots; about 12 percent organic matter (estimated); moderately alkaline; clear smooth boundary.

IIC2g—45 to 80 inches; gray (5Y 5/1) sand and lenses of sandy loam; single grain; nonsticky; about 1 percent organic matter (estimated); mildly alkaline.

Reaction before drying ranges from neutral to moderately alkaline; after air drying for 30 days or more it becomes extremely acid. Sulfur content ranges from about 1.5 to 4.5 percent throughout the soil.

The A horizon has hue of 10YR, 5Y, or 2.5Y, value of 2 to 4, and chroma of 2 or less. Organic matter content ranges from about 20 to 30 percent. The n value is greater than 1. Total thickness of the A horizon ranges from 10 to 24 inches.

The C1g horizon has hue of 10YR, 5Y, or 2.5Y, value of 2 to 4, and chroma of 1 or 2. Texture is clay, silty clay, sandy clay, or sandy clay loam. Thickness is 20 to 50 inches.

The IIC horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2 or hue of 5Y, value of 4 or 5, and chroma of 1. Texture is loamy sand, sand, or sandy loam. Organic matter content is less than 2 percent.

Some pedons lack a IIC horizon and have a C2g horizon or C2g and C3g horizons with color and texture of the C1g horizon to a depth of 80 inches or more.

Bonifay series

Soils of the Bonifay series are loamy, siliceous, thermic Grossarenic Plinthic Paleudults. These soils are nearly level to gently sloping and well drained. They formed in thick beds of sandy and loamy material. These soils are on broad or narrow ridgetops in the uplands. Slopes range from 0 to 5 percent.

Bonifay soils are near Albany, Dothan, Fuquay, Lakeland, Lucy, Orangeburg, Pactolus, Tifton, and Troup soils. Albany soils are in low upland positions; they are somewhat poorly drained, and they do not have a horizon containing more than 5 percent plinthite in the upper 60 inches. Dothan soils are on broad and narrow ridgetops and hillsides and have an A horizon less than 20 inches thick. Fuquay soils are on broad and narrow ridgetops and hillsides and have a sandy A horizon 20 to 40 inches thick. Nearly level to gently sloping Lakeland

soils are on broad ridges and on hillsides; they do not have a Bt horizon above a depth of 80 inches. Lucy soils are on broad and narrow ridgetops and hillsides; they have a sandy A horizon 20 to 40 inches thick and do not have plinthite in the Bt horizon. Orangeburg soils are on broad and narrow ridgetops and hillsides; they have an A horizon less than 20 inches thick and do not have plinthite in the Bt horizon. Pactolus soils are in low upland positions; they are moderately well drained to somewhat poorly drained, and they do not have a Bt horizon above a depth of 80 inches. Tifton soils are on broad and narrow ridgetops and hillsides; they have an A horizon less than 20 inches thick and contain more than 5 percent strongly cemented iron concretions. Nearly level to gently sloping Troup soils are in broad areas and on hillsides; they do not have more than 5 percent plinthite above a depth of 60 inches.

Typical pedon of Bonifay loamy sand, 0 to 5 percent slopes, in a wooded area approximately 4 miles east of State Highway 197 and 8 yards west of trail road, SE1/4NE1/4 sec. 27, T. 3 N., R. 29 W.:

A11—0 to 4 inches; very dark grayish brown (10YR 3/2) loamy sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.

A12—4 to 6 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.

A21—6 to 30 inches; yellowish brown (10YR 5/4) loamy sand; weak fine granular structure; very friable; common fine and medium roots; strongly acid; gradual wavy boundary.

A22—30 to 47 inches; brownish yellow (10YR 6/6) loamy sand; few medium distinct strong brown (7.5YR 5/6) and common medium distinct very pale brown (10YR 7/3) mottles; common clean sand grains; weak fine granular structure; very friable; common fine and few medium roots; strongly acid.

B1—47 to 51 inches; yellowish brown (10YR 5/6) sandy loam; common medium distinct strong brown (7.5YR 5/6), few medium distinct strong brown (7.5YR 5/6), few medium distinct yellowish red (5YR 4/6), and few medium faint brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; few fine roots; estimated 4 percent firm brittle plinthite; strongly acid; gradual wavy boundary.

B2t—51 to 63 inches; mottled yellowish brown (10YR 5/6) strong brown (7.5YR 5.6), yellowish red (5YR 4/6), red (2.5YR 4/6), and very pale brown (10YR 7/3) sandy loam; moderate medium subangular blocky structure; friable; few thin clay films on peds; estimated 15 percent firm brittle plinthite; strongly acid.

The solum ranges from 60 inches to more than 80 inches in thickness. Reaction is strongly acid or very strongly acid in all horizons except in the A1 or Ap horizon where the soil has been limed. Depth to a horizon containing more than 5 percent plinthite generally ranges from 43 to 60 inches. Content of strongly cemented iron oxide concretions ranges from 0 to 5 percent, by volume, throughout the soil.

The A1 or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3 or hue of 2.5Y, value of 4 or 5, and chroma of 2. It ranges from 5 to 8 inches in thickness. The A2 horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 8. It has mottles in shades of red, brown, and yellow in the lower part. The A2 horizon ranges from 36 to 49 inches in thickness. Uncoated sand grains are common in this horizon and range from light gray to white.

The B1 horizon has hue of 10YR, value of 5 or 6, and chroma of 6 to 8 or hue of 7.5YR, value of 5, and chroma of 6. It has mottles in shades of red, brown, and yellow. The B1t horizon ranges from 3 to 12 inches in thickness.

The B2t horizon, where it has a dominant color, has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. It has mottles in shades of brown, yellow, red, and gray. In many pedons the B2t horizon is reticulately mottled in various shades of gray, brown, yellow, and red. Texture of the B2t horizon is sandy loam or sandy clay loam.

Chewacla series

Soils of the Chewacla series are fine-loamy, mixed, thermic Fluvaquentic Dystrochrepts. These soils are nearly level and somewhat poorly drained. They formed in loamy stream alluvium. These soils are on flood plains along stream terraces. Slopes range from 0 to 2 percent.

Chewacla soils are near Wahee, Riverview, Kalmia, and Maxton soils. Wahee soils have a finer textured subsoil. Riverview soils are on the highest elevations of the flood plain and are well drained. Kalmia and Maxton soils are on low terraces of larger streams, are better drained, and have a coarser textured subsoil.

Chewacla soils are mapped only in association with Riverview and Wahee soils.

Typical pedon of Chewacla silt loam in a wooded area of Chewacla-Wahee-Riverview association, approximately 0.5 mile east of Escambia River and 0.2 mile south of State Highway 4, SW1/4SE1/4 sec. 10, T. 5 N., R. 30 W.:

A1—0 to 7 inches; dark brown (10YR 3/3) silt loam; weak medium granular structure; friable; many fine roots; strongly acid; gradual smooth boundary.

B1—7 to 11 inches; brown (10YR 4/3) silty clay loam; weak fine subangular blocky structure; friable; common fine and few medium roots; strongly acid; gradual smooth boundary.

B21—11 to 16 inches; brown (10YR 4/3) silty clay loam; common fine faint grayish brown and few fine faint brown mottles; weak fine subangular blocky structure; friable; common fine and few medium roots; strongly acid; gradual smooth boundary.

B22—16 to 27 inches; mottled gray (10YR 5/1), grayish brown (10YR 5/2), yellowish brown (10YR 5/6), brown (10YR 5/3), and strong brown (7.5YR 5/6) silty clay loam; weak medium subangular blocky structure; friable; few fine roots; strongly acid; gradual smooth boundary.

B31—27 to 43 inches; mottled gray (10YR 5/1), grayish brown (10YR 5/2), yellowish brown (10YR 5/6), brown (10YR 5/3), and strong brown (7.5YR 5/6) sandy clay loam; weak fine subangular blocky structure; firm; few fine roots; strongly acid; gradual wavy boundary.

B32—43 to 47 inches; mottled gray (10YR 6/1), yellowish brown (10YR 5/4), and strong brown (7.5YR 5/6) sandy loam; weak coarse subangular blocky structure; friable; strongly acid; gradual wavy boundary.

C1—47 to 50 inches; mottled gray (10YR 6/1), yellowish brown (10YR 5/4), and strong brown (7.5YR 5/6) loamy sand; single grain; loose; strongly acid; gradual wavy boundary.

C2—50 to 63 inches; light gray (10YR 7/2) sand; single grain; loose; strongly acid.

The solum ranges from 36 to 72 inches in thickness. Reaction is medium acid to strongly acid in all horizons. Content of mica flakes ranges from none to few.

The A1 horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4 or hue of 7.5YR, value of 3 to 5, and chroma of 2 to 4. It ranges from 4 to 8 inches in thickness.

The B1 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It ranges from 4 to 7 inches in thickness. The texture is silt loam, loam, or silty clay loam.

The B2 horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 6. It has few to common mottles in shades of gray, yellow, red, and brown. The lower part of the B2 horizon is generally mottled in shades of brown, yellow, gray, and red. Texture is loam, silt loam, sandy clay loam, silty clay loam, and clay loam. Depth to gray mottles is less than 24 inches. Weighted average clay content of the B horizon is 18 to 35 percent.

The B3 horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 6. It has few to common mottles in shades of gray, yellow, red, and brown. This horizon is generally mottled in shades of brown, yellow, gray, and red. Texture of the B3 horizon is sandy loam, loam, sandy clay loam, or silt loam.

The C horizon commonly is mottled in various shades of gray, yellow, and brown, or it has hue of 10YR, value of 5 or 6, and chroma of 2 or 3. Texture is sandy loam, loamy sand, or sand.

Cowarts series

Soils of the Cowarts series are fine-loamy, siliceous, thermic Typic Hapludults. These soils are sloping to strongly sloping and well drained. They formed in loamy marine sediment. These soils are on uplands. Slopes range from 5 to 12 percent.

Cowarts soils are near Dothan, Fuquay, Orangeburg, Tifton, and Troup soils. Dothan and Tifton soils contain more than 5 percent plinthite. Fuquay soils contain more than 5 percent plinthite and have a sandy A horizon 20 to 40 inches thick. Orangeburg soils have a thicker Bt horizon. Troup soils have a sandy A horizon 40 to 80 inches thick.

Typical pedon of Cowarts loamy fine sand, in a wooded area of Troup-Orangeburg-Cowarts complex, 5 to 12 percent slopes, approximately 0.1 mile east of Highway 89 and 0.4 mile north of trail road, NE1/4NE1/4 sec. 25, T. 6 N., R. 29 W.:

A11—0 to 3 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak medium granular structure; very friable; many fine roots; strongly acid; gradual smooth boundary.

A12—3 to 6 inches; dark brown (10YR 4/3) loamy fine sand; weak medium granular structure; very friable; many fine roots; strongly acid; clear wavy boundary.

B1—6 to 9 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium granular structure; friable; many fine and medium roots; strongly acid; clear wavy boundary.

B21t—9 to 18 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; common fine and medium roots; sand grains coated and bridged with clay; strongly acid; clear wavy boundary.

B22t—18 to 23 inches; strong brown (7.5YR 5/6) sandy clay loam; common medium distinct red (2.5YR 4/8) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; thin patchy clay films on peds; sand grains coated and bridged with clay; strongly acid; clear wavy boundary.

C—23 to 60 inches; mottled red (2.5YR 4/6), yellowish brown (10YR 5/6), brownish yellow (10YR 6/6), strong brown (7.5YR 5/6, 5/8), and light brownish gray (10YR 6/2) sandy clay loam; pockets of coarser and finer textured material; massive; firm; strongly acid.

The solum ranges from 20 to 40 inches in thickness. The soil is strongly acid or very strongly acid.

The A1 horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Thickness ranges from 4 to 6 inches.

The B1 horizon has hue of 10YR, 7.5YR, or 2.5Y, value of 5, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or sandy clay loam.

The Bt horizon has hue of 10YR or 7.5Y, value of 5 or 6, and chroma of 4 to 8. It has mottles in shades of yellow, red, and brown in the lower part. Texture of the Bt horizon is commonly sandy clay loam but ranges to sandy clay in the lower part. Content of nodules of plinthite ranges from 0 to 5 percent. Thickness ranges from 12 to 25 inches.

The C horizon is mottled. The mottles have hue of 10YR, 7.5YR, 5YR, and 2.5YR, values of 4 to 7, and chroma of 2 through 8. Texture ranges from loamy sand to sandy clay. Pockets of coarser or finer material are commonly present.

Dorovan series

Soils of the Dorovan series are dysic, thermic Typic Medisaprists. These soils are very poorly drained and organic. They formed by the decomposition of woody and herbaceous plant remains. These soils are on flood plains of major streams and in large hardwood swamps of the Coastal Plain. Water is at or near the surface throughout the year. Slopes are less than 2 percent.

Dorovan soils are near Bibb, Chewacla, Handsboro, Wahee, Pactolus, Pamlico, Pickney, Riverview, and Rutlege soils. Bibb, Chewacla, Wahee, Pactolus, Pickney, Riverview, and Rutlege soils are mineral soils. Pamlico soils have thinner organic material. Handsboro soils have high sulfur content above a depth of 40 inches.

Typical pedon of Dorovan muck in a wooded area of Dorovan-Pamlico association, approximately 30 yards north of U. S. Highway 90 and near center of low swamp along highway, SE1/4SE1/4 sec. 8, T. 1 N., R. 28 W.:

Oa1—0 to 1 inch; dark reddish brown (5YR 2/2) muck; about 10 percent fiber, less than 4 percent rubbed; moderate coarse granular structure; nonsticky; many fine and common medium roots; sodium pyrophosphate extract is dark yellowish brown (10YR 4/4); very strongly acid; clear smooth boundary.

Oa2—1 to 15 inches; black (5YR 2/1) muck; about 4 percent fiber, less than 2 percent rubbed; weak coarse granular structure; nonsticky; common fine and medium roots; sodium pyrophosphate extract is reddish brown (5YR 4/3); very strongly acid; clear smooth boundary.

Oa3—15 to 55 inches; black (N 2/) muck; about 8 percent fiber, less than 3 percent rubbed; massive; slightly sticky; common fine and medium roots; sodium pyrophosphate extract is brown (10YR 4/3); very strongly acid; gradual smooth boundary.

Oa4—55 to 63 inches; dark reddish brown (5YR 3/2) muck; about 5 percent fiber, less than 2 percent rubbed; massive; slightly sticky; about 48 percent mineral content; few fine and medium roots; sodium pyrophosphate extract is brown (10YR 4/3); very strongly acid.

The organic material is more than 51 inches thick. In many areas sand is at a depth of 51 to 80 inches. Reaction is less than 4.5 in calcium chloride.

The Oa layer has hue of 10YR or 5YR or is neutral; and it has value of 2 or 3 and chroma of 2 or less. Fiber content in the organic horizons is usually less than 30 percent unrubbed and less than 5 percent rubbed.

The IIC horizon, where present, is sand of various shades of gray and brown.

Dothan series

Soils of the Dothan series are fine-loamy, siliceous, thermic Plinthic Paleudults. These soils are nearly level to sloping and well drained. They formed in thick beds of unconsolidated loamy marine deposits. These soils are on broad and narrow ridgetops and side slopes in the uplands. Slopes range from 0 to 12 percent.

Dothan soils are near the Escambia, Esto, Fuquay, Orangeburg, and Tifton soils. Escambia soils are in lower lying areas and are somewhat poorly drained. Esto soils are on small knolls and ridges and are more than 35 percent clay in the Bt horizon. Fuquay soils are on broad and narrow ridges and hillsides and have a thicker A horizon. Orangeburg soils are on broad and narrow ridges and hillsides; they have a red subsoil and do not have a horizon that is more than 5 percent plinthite above a depth of 60 inches. Tifton soils have more than 5 percent ironstone pebbles in the A horizon and the upper part of the B horizon.

Typical pedon of Dothan fine sandy loam, 2 to 5 percent slopes, in a forested area approximately 85 yards east of State Highway 191 and 25 yards south of trail road, SE1/4SW1/4 sec. 34, T. 4 N., R. 27 W.:

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

B1—6 to 14 inches; yellowish brown (10YR 5/8) fine sandy loam; weak medium subangular blocky structure; friable; many fine and few medium roots; strongly acid; gradual smooth boundary.

B21t—14 to 30 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; many fine roots; thin clay films on peds; strongly acid; gradual wavy boundary.

B22t—30 to 43 inches; brownish yellow (10YR 6/8) sandy clay loam; common medium distinct red (2.5YR 4/8) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; thin clay films on peds; about 6 percent plinthite; strongly acid; gradual smooth boundary.

B23t—43 to 60 inches; mottled brownish yellow (10YR 6/6), yellowish brown (10YR 5/6), very pale brown (10YR 7/4), strong brown (7.5YR 5/8), and red

(2.5YR 4/8) sandy clay; weak medium subangular blocky structure; friable; slightly sticky; thin clay films on peds; approximately 10 percent brittle plinthite; strongly acid.

The solum ranges from 60 to more than 80 inches in thickness. Reaction is strongly acid or very strongly acid throughout the profile except in the A horizon where the soil has been limed. Depth to a horizon that contains more than 5 percent plinthite ranges from 24 to 60 inches. Content of strongly cemented iron oxide concretion ranges from 0 to 5 percent, by volume, throughout the soil.

The A1 or Ap horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 to 4. It ranges from 3 to 9 inches in thickness. Some pedons have an A2 horizon with hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6. The A2 horizon, where present, ranges from 3 to 10 inches in thickness. The A horizon is 5 to 19 inches thick.

The B1 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 8. It generally ranges from 3 to 11 inches in thickness. Texture is sandy loam, fine sandy loam, or sandy clay loam.

The B21t and B22t horizons have hue of 10YR, 7.5YR, or 2.5Y, value of 5 or 6, and chroma of 6 or 8. The B22t horizon has mottles in shades of yellow, brown, or red. Texture is sandy clay loam. The B23t horizon has mottles with hue of 10YR, 7.5YR, and 2.5YR, value of 4 to 7, and chroma of 4 to 8. The lower part of the B2t horizon has 5 to 10 percent, by volume, firm or brittle plinthite. The texture of the B23t horizon ranges from sandy clay loam to sandy clay.

Escambia series

Soils of the Escambia series are coarse-loamy, siliceous, thermic, Plinthaquic Paleudults. These soils are nearly level and somewhat poorly drained. They formed in loamy marine deposits. These soils are along narrow drainageways, around depressions, and on low flats between small streams in the uplands. Slopes range from 0 to 2 percent.

Escambia soils are near Dothan, Fuquay, Lynchburg, and Rains soils. Dothan soils are on broad and narrow ridgetops and hillsides and are better drained. Fuquay soils are on broad and narrow ridgetops and hillsides, have an A horizon more than 20 inches thick, and are better drained. Lynchburg soils have more than 18 percent clay in the upper 20 inches of the B horizon and do not have more than 5 percent plinthite in the Bt horizon. Rains soils are in ponded or low lying positions on uplands, are more poorly drained, and do not have more than 5 percent plinthite on the Bt horizon.

Typical pedon of Escambia fine sandy loam, 0 to 2 percent slopes, in a wooded area, approximately 0.75 miles north of State Highway 191 and 100 yards west of paved road, NW1/4NW1/4 sec. 13, T. 2 N., R. 29 W.:

A1—0 to 7 inches; very dark gray (10YR 3/1) fine sandy loam; moderate medium granular structure; very friable; many fine and common medium roots; strongly acid; clear smooth boundary.

A3—7 to 10 inches; brown (10YR 5/3) fine sandy loam; common medium distinct splotches of very dark gray (10YR 3/1) along root channels; weak medium granular structure; very friable; common fine and few medium roots; strongly acid; gradual smooth boundary.

B1—10 to 14 inches; yellowish brown (10YR 5/4) fine sandy loam; few fine distinct strong brown (7.5YR 5/6) mottles; weak medium granular structure; very friable; common fine and few medium roots; sand grains coated and bridged with clay; strongly acid; gradual smooth boundary.

B21t—14 to 19 inches; brownish yellow (10YR 6/6) fine sandy loam; common medium distinct strong brown (7.5YR 5/6), few fine faint yellowish brown, and common medium distinct dark red (2.5YR 3/6) mottles; weak medium subangular blocky structure; friable; common fine and few medium roots; sand grains coated and bridged with clay; estimated 3 percent, by volume, firm brittle nonindurated plinthite; strongly acid; gradual smooth boundary.

B22t—19 to 37 inches; mottled light brownish gray (10YR 6/2) pale brown (10YR 6/3), brownish yellow (10YR 6/6), yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), dark red (2.5YR 3/6), and red (2.5YR 4/6) fine sandy loam; moderate medium subangular blocky structure; friable; common fine roots; few clay films on peds; estimated 15 percent, by volume, firm brittle nonindurated plinthite; strongly acid; gradual wavy boundary.

B23t—37 to 65 inches; mottled light gray (10YR 6/1) and (10YR 7/1) brownish yellow (10YR 6/6), strong brown (7.5YR 5/6), and red (2.5YR 4/6) fine sandy loam; weak medium subangular blocky structure; friable; few clay films on peds; estimated 5 percent, by volume, firm brittle nonindurated plinthite; strongly acid.

The solum is more than 60 inches thick. Reaction ranges from strongly acid to very strongly acid in all horizons except where the soil has been limed. Depth to a horizon with more than 5 percent plinthite ranges from 20 to 42 inches.

The Ap or A1 horizon has hue of 10YR, values of 3 or 4, and chroma of 1 or 2 or is neutral and has value of 2. It ranges from 3 to 8 inches in thickness. The A3 horizon, where present, has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. It ranges from 3 to 9 inches in thickness. The A3 horizon is sandy loam, fine sandy loam, or loam.

The B1 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6. It has few to common mottles in shades of gray, brown, and yellow. The texture is fine sandy loam or sandy loam. It ranges from 4 to 12 inches in thickness.

The B21t horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6. It has few to common mottles in shades of red, brown, yellow, and gray. It ranges from 5 to 15 inches in thickness. The B22t horizon and B23t horizon are recticulately mottled in various shades of red, brown, yellow, and gray. Texture of the Bt horizon is fine sandy loam or sandy clay loam. The upper 10 inches of the Bt horizon has gray mottles with chroma of 2 or less. The mottles increase in size and intensity with depth. The upper 20 inches of the B horizon has less than 18 percent clay and more than 20 percent silt.

Esto series

Soils of the Esto series are clayey, kaolinitic, thermic Typic Paleudults. These soils are gently sloping to sloping and well drained. They formed in clay and sandy clay material common to the Coastal Plain. These soils are on knolls, short choppy side slopes, and ridge crests in the uplands. Slopes range from 2 to 8 percent.

Esto soils are near Dothan, Fuquay, Lucy, Orangeburg, and Tifton soils. Dothan soils are on broad and narrow ridgetops and hillsides and have a Bt horizon that is less than 35 percent clay and more than 5 percent plinthite above a depth of 60 inches. Fuquay soils are on broad and narrow ridgetops and hillsides and have a thicker A horizon, contain more than 5 percent plinthite, and have less than 35 percent clay in the Bt horizon. Lucy soils are on broad and narrow ridgetops and hillsides and have a thicker A horizon and less clay in the Bt horizon. Orangeburg soils are on broad and narrow ridgetops and hillsides and have a Bt horizon that is less than 35 percent clay. Tifton soils are on broad and narrow ridgetops and hillsides and have a Bt horizon that is less than 35 percent clay and more than 5 percent plinthite above a depth of 60 inches.

Typical pedon of Esto loam, 2 to 5 percent slopes, in a wooded area approximately 1.6 miles south of State Highway 4 and 10 yards north of trail road, SW1/4SE1/4 sec. 22, T. 4 N., R. 26 W.:

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) loam; moderate medium granular structure; friable; many fine and common medium roots; strongly acid; gradual smooth boundary.

A2—4 to 7 inches; yellowish brown (10YR 5/4) loam; weak medium granular structure; friable; many fine and common medium roots; strongly acid; gradual smooth boundary.

B1—7 to 12 inches; yellowish brown (10YR 5/8) clay loam; weak medium subangular blocky structure; friable; common fine and few medium roots; strongly acid; gradual smooth boundary.

B21t—12 to 16 inches; yellowish brown (10YR 5/8) clay; few fine faint strong brown mottles; moderate medium subangular blocky structure; friable; common fine and few medium roots; few thin clay films on peds; strongly acid; gradual smooth boundary.

B22t—16 to 24 inches; brownish yellow (10YR 6/6) clay; common fine faint yellowish brown and few fine distinct yellowish red (5YR 5/8) and red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine and medium roots; patchy clay films on peds; strongly acid; gradual wavy boundary.

B23t—24 to 34 inches; mottled brownish yellow (10YR 6/6), yellowish brown (10YR 5/8), light gray (10YR 7/1), strong brown (7.5YR 5/6), yellowish red (5YR 5/8), and red (2.5YR 4/6) clay; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine and medium roots; patchy clay films on peds; strongly acid; gradual smooth boundary.

B24t—34 to 61 inches; mottled brownish yellow (10YR 6/8), light gray (10YR 7/1), strong brown (7.5YR 5/8), and red (2.5YR 4/6) clay; weak medium subangular blocky structure; firm; patchy clay films on peds; strongly acid; gradual smooth boundary.

Cg—61 to 78 inches; light gray (10YR 7/1) clay; common medium distinct brownish yellow (10YR 6/8), common fine distinct strong brown (7.5YR 5/8) and yellowish red (5YR 5/8), and few medium distinct red (2.5YR 4/8) mottles; massive; firm; strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid in all horizons.

The A1 or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2. It ranges from 3 to 5 inches in thickness. The A2 horizon, where present, has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. It ranges from 3 to 6 inches in thickness.

The B1 horizon, where present, has hue of 10YR and 7.5YR, value of 5 or 6, and chroma of 4 to 8. It ranges from 3 to 6 inches in thickness. The texture is clay loam or sandy clay loam.

The B21t and B22t horizons have hue of 10YR, 5YR, and 7.5YR, value of 5 or 6, and chroma of 4 to 8. It has mottles in shades of brown, yellow, and red. In some pedons the B21t and B22t horizons lack a matrix color and are mottled in shades of gray, brown, yellow, and red. The B23t and B24t horizons are highly mottled in various shades of gray, brown, yellow, and red. The Bt horizon is dominantly clay but in place is clay loam and sandy clay. It extends to a depth of more than 60 inches.

The C horizon has hue of 10YR, value of 7, and chroma of 1. It has mottles in shades of brown, yellow, and red.

Fuquay series

Soils of the Fuquay series are loamy, siliceous, thermic Arenic Plinthic Paleudults. These soils are nearly level to sloping, and well drained. They formed in sandy and loamy marine sediments of the Coastal Plain. These soils are on broad and narrow ridgetops and on hillsides in the uplands. Slopes range from 0 to 8 percent.

Fuquay soils are near Bonifay, Dothan, Lucy, Orangeburg, Tifton, and Troup soils. Bonifay soils are on broad and narrow ridgetops and have a sandy A horizon more than 40 inches thick. Dothan soils are on broad and narrow ridgetops and hillsides and have an A horizon less than 20 inches thick. Lucy soils are on broad and narrow ridgetops and hillsides and do not have a Bt horizon that is more than 5 percent plinthite. Orangeburg soils are on broad and narrow ridgetops and hillsides, have an A horizon less than 20 inches thick, and do not have plinthite in the Bt horizon. Tifton soils are on broad and narrow ridgetops and hillsides, have an A horizon less than 20 inches thick, and contain more than 5 percent strongly cemented iron concretions. Troup soils are in broad, nearly level to gently sloping areas and on hillsides, have a sandy A horizon more than 40 inches thick, and do not have plinthite in the Bt horizon.

Typical pedon of Fuquay loamy sand, 0 to 5 percent slopes, in a wooded area approximately 0.5 mile west of State Highway 87A, NE1/4NW1/4 sec. 13, T. 2 N., R. 28 W.:

A11—0 to 4 inches; dark grayish brown (10YR 4/2) loamy sand; weak medium granular structure; very friable; many fine and medium roots; strongly acid; gradual smooth boundary.

A12—4 to 7 inches; brown (10YR 4/3) loamy sand; weak medium granular structure; very friable; many fine and medium roots; strongly acid; gradual smooth boundary.

A2—7 to 26 inches; yellowish brown (10YR 5/4) loamy sand; weak medium granular structure; very friable; common fine and medium roots; strongly acid; gradual smooth boundary.

B1—26 to 37 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; strongly acid; gradual smooth boundary.

B21t—37 to 43 inches; yellowish brown (10YR 5/6) fine sandy loam; few medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine and medium roots; estimated 2 percent, by volume, hard brittle nonindurated plinthite; thin patchy clay films on peds; strongly acid; gradual smooth boundary.

B22t—43 to 59 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; few fine roots; estimated 10 percent, by volume, hard brittle nonindurated plinthite; few small iron concretions; thin patchy clay films on peds; strongly acid; gradual smooth boundary.

B3—59 to 80 inches; mottled brownish yellow (10YR 6/6), light gray (10YR 7/1), strong brown (7.5YR 5/6), light reddish brown (5YR 6/4), red (2.5YR 4/8), and light red (2.5YR 6/8) sandy loam; weak medium subangular blocky structure; firm; few medium iron concretions; strongly acid.

The solum is more than 80 inches thick. Reaction is medium acid to very strongly acid in all horizons except in the A horizon where the soil has been limed. Depth to a horizon containing more than 5 percent plinthite generally ranges from 38 to 60 inches. Strongly cemented iron oxide concretions range from 0 to 5 percent, by volume, throughout the soil.

The A1 or Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 3. It ranges from 4 to 9 inches in thickness. The A2 horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 3 to 6. The A horizon ranges from 20 to 40 inches in thickness.

The B1 horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. Texture is sandy loam or sandy clay loam. Thickness ranges from 4 to 11 inches.

The B2t horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. Most pedons have few to common mottles in shades of brown, yellow, and red. Texture is dominantly sandy clay loam but in places ranges to sandy loam in the upper part.

The B3 horizon, where present, has mottles with hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 4 to 8; hue of 7.5YR, value of 5, and chroma of 6 through 8; or hue of 10YR, value of 6 or 7, and chroma of 1 to 8. Texture ranges from sandy loam to sandy clay loam.

Garcon series

Soils of the Garcon series are loamy, siliceous, thermic Arenic Hapludults. These soils are nearly level and somewhat poorly drained. They formed in loamy acid marine sediment. These soils are at low positions in the flatwoods. Slopes range from 0 to 2 percent.

Garcon soils are near Albany, Mulat, Pactolus, and Rains soils. Albany soils have a solum more than 60 inches thick. Mulat soils are poorly drained. Pactolus soils do not have a Bt horizon and have sandy horizons 80 inches or more thick. Rains soils have an argillic horizon that extends from a depth between 10 and 20 inches to a depth of more than 60 inches.

Typical pedon of Garcon loamy fine sand, approximately 2 miles south of the intersection of Interstate 10

and State Highway 281 and 0.5 mile east of Highway 281, SW1/4NW1/4 sec. 14, T. 1 S., R. 28 W.:

A11—0 to 4 inches; very dark gray (10YR 3/1) loamy fine sand; weak medium granular structure; very friable; many fine and common medium roots; strongly acid; gradual wavy boundary.

A12—4 to 8 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak medium granular structure; very friable; many fine and common medium roots; strongly acid; clear wavy boundary.

A21—8 to 20 inches; yellowish brown (10YR 5/6) loamy fine sand; single grain; loose; common fine roots; strongly acid; gradual smooth boundary.

A22—20 to 31 inches; brownish yellow (10YR 6/6) loamy fine sand; few fine distinct light brownish gray (10YR 6/2) and few fine faint yellowish brown (10YR 5/6) mottles; single grain; loose; strongly acid; gradual wavy boundary.

B21t—31 to 39 inches; fine sandy loam, yellowish brown (10YR 5/4), mostly on ped surfaces; common medium distinct brownish yellow (10YR 6/6) and light brownish gray (10YR 6/2) and few medium distinct pale brown (10YR 6/3) and brown (7.5YR 4/4) mottles, mostly within peds; weak medium subangular blocky structure; friable; sand grains bridged and coated with clay; strongly acid; gradual smooth boundary.

B22t—39 to 51 inches; gray (10YR 5/1) fine sandy loam; common medium distinct reddish brown (5YR 5/4) and common medium prominent red (2.5YR 4/6) mottles; weak medium subangular blocky structure; slightly sticky; sand grains bridged and coated with clay; strongly acid; gradual smooth boundary.

B3—51 to 58 inches; loamy fine sand; common medium distinct gray (10YR 6/1), pale brown (10YR 6/3), yellowish brown, (10YR 5/6), and strong brown (7.5YR 5/6) and few medium distinct yellowish red (5YR 5/6) mottles; single grain; nonsticky; few mica flakes; strongly acid; gradual wavy boundary.

C1—58 to 69 inches; gray (10YR 6/1) fine sand; few fine distinct yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), and light reddish brown (5YR 6/4) mottles, common medium faint light brownish gray (10YR 6/2) mottles; single grain; nonsticky; few mica flakes; strongly acid; gradual wavy boundary.

C2—69 to 80 inches; yellowish red (5YR 5/8) fine sand; few fine distinct light brownish gray (10YR 6/2), yellowish brown (10YR 5/6), and red (2.5YR 5/8) and few medium distinct strong brown (7.5YR 5/6) mottles; single grain; nonsticky; few mica flakes; strongly acid.

The solum ranges from 40 to 60 inches in thickness. Reaction ranges from very strongly acid to strongly acid throughout.

The A11 horizon has hue of 10YR, value of 2 to 4 and chroma of 1 or 2. The A12 horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. The A2 horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 6 or hue of 2.5Y, value of 6, and chroma of 4. Mottles in shades of brown, yellow, and gray are in the lower part of the A2 horizon. Texture is loamy fine sand, loamy sand, fine sand, or sand.

The B21t horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 6 or hue of 7.5YR, value of 5 or 6, and chroma of 6 to 8 mostly on ped surfaces. It has medium to coarse mottles of light brownish gray, brownish yellow, gray, light gray, yellowish brown, pale brown, or brown. This horizon is sandy loam or fine sandy loam.

The B22t horizon has hue of 10YR, value of 5 or 6, and chroma of 1. It has fine to coarse mottles of light gray, strong brown, yellowish brown, reddish brown, brownish yellow, yellowish red, or red. The silt content is less than 20 percent. Texture is sandy loam, fine sandy loam, or sandy clay loam. Weighted average clay content in the upper 20 inches of the argillic horizon is less than 18 percent. In some pedons, the lower part of the B2t horizon is as much as 21 percent clay.

The B3 horizon has the same color range as the B22t horizon. Texture is loamy sand or loamy fine sand.

The C1 horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2 or is neutral and has value of 6 and chroma of 1. It has mottles in shades of red, brown, yellow, and gray. In most pedons, these mottles are fine to medium in size. Texture is sand or fine sand.

The IIC2 horizon has hue of 5YR, value of 5, and chroma of 8; hue of 10YR, value of 6 or 7, and chroma of 1 or 2; or hue of 7.5YR, value of 6 or 7, and chroma of 2. Common and few mottles of red, strong brown, brownish gray, and yellowish brown are fine and medium in size. Texture is sand or fine sand.

Handsboro series

Soils of the Handsboro series are euic, thermic Typic Sulfihemists. These soils are level and very poorly drained. They formed in organic and clayey deposits. These soils are in tidal marshes. Slopes are less than 1 percent.

Handsboro soils are near Bohicket soils. Bohicket soils are more clayey in the upper part.

Typical pedon of Handsboro muck in an area of Bohicket and Handsboro soils in tidal marsh, approximately 1,400 feet west of U.S. Highway 90 and 700 feet south of Saultsman Bayou, SE1/4SE1/4 sec. 33, T. 1 N., R. 29 W.:

Oa1—0 to 20 inches; black (10YR 2/1) (rubbed and unrubbed) muck; about 60 percent fiber, about 9 percent rubbed; massive; slightly sticky; matted with many fine live roots; alkaline; gradual smooth boundary.

IIC1&Oa2—20 to 40 inches; stratified very dark gray (10YR 3/1) clay and muck; individual strata are about 2 to 6 inches thick; massive; many fine roots; slightly sticky; moderately alkaline; gradual smooth boundary.

Oa3—40 to 64 inches; very dark gray (10YR 3/1) (rubbed and unrubbed) muck; about 50 percent fiber, less than 5 percent rubbed; massive; slightly sticky; many fine roots; moderately alkaline; clear smooth boundary.

IIC2—64 to 86 inches; dark olive gray (5Y 3/2) silty clay; common thin lenses of coarser textured material and clay; massive; sticky; moderately alkaline.

Sulfur content ranges from 2 to 4.5 percent. The organic material is dominantly sapric in all tiers, but some pedons contain layers of hemic material. There are thin mineral strata between depths of 12 and 51 inches. Combined thickness of the mineral layers is less than 16 inches above a depth of 32 inches. The Oa and IIC horizons are stratified and thickness of individual layers is variable. Reaction ranges from neutral to moderately alkaline in water throughout the profile in the natural state; after air drying, pH in calcium chloride is less than 4.5.

The Oa horizon has hue of 10YR, value of 2 or 3, and chroma of 1.

The IIC horizon has hue of 10YR, 5Y, or 2.5Y, value of 2 to 4, and chroma of 1 or 2. It is dominantly clay or silty clay but commonly has thin strata of coarser material.

Johns series

Soils of the Johns series are fine-loamy over sandy or sandy-skeletal, siliceous, thermic Aquic Hapludults. These soils are nearly level and somewhat poorly drained to moderately well drained. They formed in loamy marine and fluvial deposits. These soils are on stream terraces, primarily along the larger streams. Slopes range from 0 to 2 percent.

Johns soils are near Kalmia, Lynchburg, and Maxton soils. Kalmia soils are better drained. Lynchburg soils are along drainageways, around depressions, and on low flats between streams; they are somewhat poorly drained and have a solum more than 60 inches thick. Maxton soils are on stream terraces along the larger streams; they are redder in the subsoil and are better drained.

Typical pedon of Johns fine sandy loam in a wooded area of Johns sandy loam, approximately 1.6 miles west of State Highway 87, approximately 250 yards east of Coldwater River, and 15 yards south of trail road, SW1/4SE1/4 sec. 11, T. 3 N., R. 28 W.:

A11—0 to 5 inches; very dark grayish brown (10YR 3/2) fine sandy loam; moderate medium granular structure; very friable; many fine roots; strongly acid; gradual wavy boundary.

A12—5 to 9 inches; dark grayish brown (2.5Y 4/2) fine sandy loam; few fine distinct root channels filled with very dark grayish brown (10YR 3/2) material; weak medium subangular blocky structure; friable; many fine and few medium roots; strongly acid; gradual wavy boundary.

A2—9 to 19 inches; light yellowish brown (2.5Y 6/4) loam; weak medium subangular blocky structure; friable; common fine and few medium roots; strongly acid; gradual wavy boundary.

B21t—19 to 22 inches; yellowish brown (10YR 5/4) sandy clay loam; few fine faint yellowish brown and few fine distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; few clay films on peds; strongly acid; gradual wavy boundary.

B22t—22 to 35 inches; mottled gray (10YR 6/1), yellowish brown (10YR 5/4, 5/6), strong brown (7.5YR 5/6), and yellowish red (5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few clay films on peds; strongly acid; clear wavy boundary.

IIC1—35 to 43 inches; mottled light gray (10YR 7/1), gray (10YR 6/1), very pale brown (10YR 7/4), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/6) stratified loamy sand and sand; pockets of sandy loam; massive; very friable; strongly acid; gradual wavy boundary.

IIC2g—43 to 63 inches; mixed light gray (10YR 7/1) and white (10YR 8/1) sand; common medium distinct olive yellow (2.5Y 6/6) mottles; single grain; loose; strongly acid.

The solum ranges from 20 to 40 inches in thickness. Reaction is strongly acid or very strongly acid in all horizons except in the A horizon where the soil has been limed. Content of mica flakes is none to few.

The A1 horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2 or hue of 2.5Y, value of 3 to 5, and chroma of 2. It ranges from 5 to 11 inches in thickness. The A2 horizon, where present, has hue of 10YR, value of 4 to 6, and chroma of 3 or 4 or hue of 2.5Y, value of 5 or 6, and chroma of 4. It ranges from 5 to 10 inches in thickness. The A2 horizon is loamy fine sand, fine sandy loam, or loam.

The B1 horizon has hue of 10YR and 2.5Y, value of 5 or 6, and chroma of 4 to 6. It has few to common mottles in shades of gray, brown, and yellow in a few pedons. The texture is fine sandy loam or loam. This horizon ranges from 0 to 10 inches in thickness.

The B2t horizon has hue of 10YR and 2.5Y, value of 5 or 6, and chroma of 4 to 6. It has few to common mottles in shades of gray, brown, and yellow. In some pedons the lower part of the B2t horizon is mottled in

various shades of gray, yellow, red, and brown. The B2t horizon ranges from 10 to 24 inches in thickness. The texture is fine sandy loam or sandy clay loam. The upper 20 inches of the B horizon is 18 to 35 percent clay.

The B3 horizon, where present, is similar in color to the B2t horizon. It ranges from 2 to 13 inches in thickness. Texture is fine sandy loam and contains considerably less clay than the B2t horizon.

The IIC horizon has hue of 10YR, value of 5 to 8, and chroma of 1 to 4; hue of 7.5YR, value of 6, and chroma of 8; or hue of 2.5Y, value of 7 or 8, and chroma of 1. It has few to common mottles in shades of gray, yellow, and brown. In some pedons the IIC horizon is mottled white, brown, yellow, and gray. The texture is sand or loamy sand, and in some pedons the upper part of the IIC has pockets of sandy loam.

Kalmia series

Soils of the Kalmia series are fine-loamy over sandy or sandy-skeletal, siliceous, thermic Typic Hapludults. These soils are gently sloping and well drained. They formed in loamy marine and fluvial deposits. These soils are on stream terraces, primarily along the larger streams in the county. Slopes range from 2 to 5 percent.

Kalmia soils are near Dothan, Johns, Lynchburg, and Maxton soils. Dothan soils are on broad and narrow ridgetops and side slopes; they have a thicker solum. Johns soils are on stream terraces and are somewhat poorly drained to moderately well drained. Lynchburg soils are along drainageways, around depressions, and on low flats between streams; they are somewhat poorly drained and have a solum more than 60 inches thick. Maxton soils are on stream terraces along the larger streams and are redder in the subsoil.

Typical pedon of Kalmia loamy fine sand, 2 to 5 percent slopes, in a wooded area, approximately 0.25 mile east of Coldwater Creek and 50 yards west of trail road, SW1/4SW1/4 sec. 9, T. 2 N., R. 27 W.:

A1—0 to 4 inches; dark grayish brown (2.5Y 4/2) loamy fine sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

A2—4 to 8 inches; light yellowish brown (2.5Y 6/4) loamy fine sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; gradual smooth boundary.

B1—8 to 14 inches; light yellowish brown (2.5Y 6/4) fine sandy loam; weak fine subangular blocky structure; friable; few fine and medium roots; strongly acid; gradual smooth boundary.

B21t—14 to 24 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; sand grains coated and bridged with clay; strongly acid; gradual smooth boundary.

B22t—24 to 36 inches; brownish yellow (10YR 6/8) sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; sand grains coated and bridged with clay; strongly acid; gradual smooth boundary.

B3—36 to 39 inches; brownish yellow (10YR 6/8) sandy loam; few fine faint brownish yellow mottles; weak fine subangular blocky structure; friable; few fine and medium roots; strongly acid; gradual smooth boundary.

IIC1—39 to 45 inches; brownish yellow (10YR 6/6) loamy sand; common medium faint brownish yellow (10YR 6/8) mottles; weak fine granular structure; very friable; few medium roots; strongly acid; gradual smooth boundary.

IIC2—45 to 52 inches; pale yellow (2.5Y 7/4) loamy sand; few fine distinct brownish yellow (10YR 6/6) and common medium distinct light gray (10YR 7/1) mottles; weak fine granular structure; very friable; strongly acid; gradual smooth boundary.

IIC3—52 to 65 inches; yellow (2.5Y 7/6) fine sand; few fine faint brownish yellow and common medium distinct light gray (10YR 7/1) mottles; single grained; loose; strongly acid.

The solum ranges from 30 to 40 inches in thickness. Reaction is strongly acid or very strongly acid in all horizons except in the A horizon where the soil has been limed. Content of mica flakes is none to few.

The A1 horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 4. It ranges from 4 to 11 inches in thickness. The A2 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6. It ranges from 4 to 10 inches in thickness. The texture of the A2 horizon is dominantly loamy fine sand but in places is loamy sand and fine sandy loam.

The B1 horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8 or hue of 2.5Y, value of 6, and chroma of 4. It ranges from 2 to 6 inches in thickness. Texture is fine sandy loam or sandy clay loam.

The B2t horizon commonly has hue of 10YR, value of 5 or 6, and chroma of 4 to 6 or hue of 7.5YR, value of 5, and chroma of 6 or 8. Mottles in various shades of red, brown, and yellow are in the lower part of the Bt horizon in some pedons. The B2t horizon ranges from 11 to 22 inches in thickness. Texture ranges from fine sandy loam to sandy clay loam.

The B3 horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8 or hue of 7.5YR, value of 5, and chroma of 6 or 8. In some pedons this horizon has few to common mottles in various shades of red, brown, and yellow. The B3 horizon ranges from 3 to 11 inches in thickness. The texture ranges from fine sandy loam to sandy clay loam.

The IIC horizon has hue of 10YR, value of 5 to 7, and chroma of 2 to 8; hue of 7.5YR, value of 5, and chroma of 6; or hue of 2.5Y, value of 7, and chroma of 4 to 6. In

some pedons this horizon has mottles in various shades of gray, brown, and yellow. Texture is sand, fine sand, or loamy sand.

Kinston series

Soils of the Kinston series are fine-loamy, siliceous, acid, thermic Typic Fluvaquents. These soils are nearly level and poorly drained. They formed in stratified loamy fluvial deposits. These soils are on flood plains along streams and are subject to frequent flooding. Slopes range from 0 to 2 percent.

Kinston soils are near Bibb, Dorovan, Escambia, Johns, Kalmia, Pactolus, Pamlico, and Rutlege soils. Bibb soils are on flood plains and have less than 18 percent clay in the 10- to 40-inch control section. Dorovan and Pamlico soils are on flood plains and depressions, are very poorly drained, and are organic. Escambia soils are along drainageways, around depressions, and on low flats between streams; they are somewhat poorly drained and have more than 5 percent plinthite above a depth of 60 inches. Johns soils are on stream terraces, primarily along the larger streams, and are somewhat poorly drained to moderately well drained. Kalmia soils are also on stream terraces and are well drained. Nearly level to gently sloping Pactolus soils are in low positions in the uplands; they are moderately well drained to somewhat poorly drained. Nearly level Rutlege soils are in low, flat depressions and ponded areas; they have an umbric epipedon and are sandy throughout.

Kinston soils are mapped only in association with Bibb soils.

Typical pedon of Kinston silt loam from a wooded area of Bibb-Kinston association, approximately 5.50 miles west of Munson, approximately 55 yards north of State Highway 4, and 330 yards west of Coldwater Creek, SW1/4NE1/4 sec. 5, T. 4 N., R. 27 W.:

A1—0 to 9 inches; very dark gray (10YR 3/1) silt loam; moderate medium granular structure; friable; many fine and medium roots; very strongly acid; gradual wavy boundary.

B1g—9 to 18 inches; dark gray (10YR 4/1) silt loam; common fine faint very dark gray (10YR 3/1) and gray (10YR 5/1) mottles; weak medium granular structure; friable; common fine and few medium roots; very strongly acid; gradual wavy boundary.

B21g—18 to 41 inches; gray (10YR 5/1) sandy clay loam; few fine faint dark gray (10YR 4/1) and few fine distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; firm; slightly sticky; few fine roots; very strongly acid; gradual wavy boundary.

B22g—41 to 50 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium faint gray (10YR 5/1) mottles; weak medium subangular blocky structure; firm; slightly sticky; very strongly acid; clear wavy boundary.

C1g—50 to 60 inches; dark gray (10YR 4/1) sand; pockets of sandy loam and loamy sand; single grain; very friable; very strongly acid; gradual wavy boundary.

C2g—60 to 65 inches; brown (10YR 5/3) sand; single grain; loose; very strongly acid.

The solum ranges from 40 inches to more than 60 inches in thickness. Reaction is strongly acid or very strongly acid in all horizons.

The A1 horizon has hue of 10YR, value of 2 to 4, and chroma of 2 or less. It ranges from 3 to 9 inches in thickness.

The B horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or less. The B horizon has few to common mottles in shades of gray, yellow, and brown. The texture is silt loam, loam, clay loam, sandy clay loam, or silty clay loam. The upper 20 inches of the B horizon is 18 to 35 percent clay.

The C horizon has hue of 10YR, value of 4 to 6, and chroma of 1 to 3. In some pedons the C horizon has few to common mottles in shades of gray, brown, and yellow. The texture of the C horizon is commonly coarse sand, sand, fine sand, or loamy sand, but in some pedons the C horizon has thin lenses or pockets of sandy loam.

Kureb series

Soils of the Kureb series are thermic, uncoated spodic Quartzipsamments. These soils are nearly level to sloping, excessively drained, and sandy. They formed in marine or eolian deposits of sand more than seven feet thick. These soils are on gently sloping to sloping uplands of the lower Coastal Plain. Slopes range from 0 to 8 percent, but are mostly 0 to 5 percent; the more sloping areas are along edges of bays.

Kureb soils are near Ortega, Pactolus, Lakeland, and Leon soils. Ortega soils are nearly level to gently sloping, do not have a light gray A2 horizon, and are moderately well drained. Pactolus soils are nearly level to gently sloping, have chroma of 2 or less between depths of 20 and 40 inches, and are seasonally wet. Nearly level to gently sloping Lakeland soils are on ridges and hillsides and do not have a B horizon. Leon soils are in the lower lying areas, have a spodic horizon, and are poorly drained.

Typical pedon of Kureb sand, 0 to 8 percent slopes, approximately 100 yards north of U.S. Highway 98 and 20 yards east of paved road, SE1/4SE1/4 sec. 23, T. 2 S., R. 28 W.:

A1—0 to 3 inches; gray (10YR 5/1) sand; single grain; loose; many fine and common medium and large roots; many uncoated sand grains give surface salt-and-pepper appearance unrubbed; strongly acid; gradual smooth boundary.

A2—3 to 16 inches; light gray (10YR 7/1) sand; single grained; loose; few fine common medium and large roots; strongly acid; clear wavy boundary.
C&Bh—16 to 24 inches; yellowish brown (10YR 5/6) sand; single grained; loose; few tongues of light gray (10YR 7/1) extend from horizon above; common medium faint strong brown (7.5YR 5/6) mottles; common fine and few medium and large roots; strongly acid; gradual wavy boundary.
C1—24 to 39 inches; yellowish brown (10YR 5/8) sand; single grained; loose; few fine and medium roots; strongly acid; gradual smooth boundary.
C2—39 to 55 inches; light yellowish brown (10YR 6/4) sand; single grained; loose; few fine and medium roots; strongly acid; gradual smooth boundary.
C3—55 to 80 inches; very pale brown (10YR 7/4) sand; single grain; loose; strongly acid.

The sandy horizons extend to a depth of 80 inches or more. Reaction ranges from strongly acid to medium acid throughout the soil. Between the depths of 10 and 40 inches, the content of silt plus clay is less than 5 percent.

The A1 horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 2 to 5 inches in thickness. The A2 horizon has hue of 10YR, value of 7, and chroma of 1. The A2 horizon ranges from 5 to 25 inches in thickness.

The C&Bh horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8. In some pedons light gray tongues extend into this horizon from above. This horizon ranges from 8 to 19 inches in thickness.

The C1 horizon has hue of 10YR, value of 5 to 7, and chroma of 6 or 8 or hue of 7.5YR, value of 6, and chroma of 8. The C2 horizon has hue of 2.5Y, value of 7, and chroma of 4 or hue of 10YR, value of 6 or 7, and chroma of 4 to 6. The C3 horizon has hue of 10YR, value of 7, and chroma of 3 or 4. In some pedons where the dominant color is very pale brown or light yellowish brown, this horizon has common, fine, faint mottles of brownish yellow. The C horizon usually consists of many uncoated sand grains that increase in content with depth.

Lakeland series

Soils of the Lakeland series are the thermic, coated Typic Quartzipsamments. These soils are nearly level to steep, excessively drained, and sandy. They formed in sandy marine sediment. These soils are on broad, nearly level to gently sloping ridges and on hillsides in the uplands. Slopes range from 0 to 30 percent.

Lakeland soils are near Bonifay, Ortega, Pactolus, and Troup soils. Bonifay soils are on broad and narrow ridgetops and have a Bt horizon. Ortega soils are nearly level to gently sloping, are moderately well drained, and have less than 5 percent silt plus clay between depths of 10 and 40 inches. Pactolus soils are in lower lying areas, have chroma of 2 or less between depths of 20 and 40 inches, and are seasonally wet. Nearly level to gently sloping Troup soils are on ridges and hillsides and have a Bt horizon.

Typical pedon of Lakeland sand, 0 to 5 percent slopes, in a wooded area, approximately 0.6 mile north of Harold and 15 yards west of paved road, NE1/4NE1/4 sec. 19, T. 2 N., R. 26 W.:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) sand; single grain; loose; many uncoated sand grains; many fine and common medium roots; strongly acid; clear wavy boundary.
C1—4 to 8 inches; yellowish brown (10YR 5/4) sand; common streaks of dark grayish brown (10YR 4/2) along root channels; single grained; loose; common uncoated sand grains; many fine and common medium roots; strongly acid; gradual wavy boundary.
C2—8 to 32 inches; yellowish brown (10YR 5/6) sand; single grain; loose; few uncoated sand grains; common fine and few medium roots; strongly acid; gradual wavy boundary.
C3—32 to 62 inches; yellowish brown (10YR 5/6) sand; common medium distinct mottles of very pale brown (10YR 7/3); single grain; loose; common uncoated sand grains; few fine roots; strongly acid; gradual wavy boundary.
C4—62 to 83 inches; very pale brown (10YR 7/4) sand; common medium distinct yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) mottles; single grain; loose; many very pale brown (10YR 7/3) uncoated sand grains; strongly acid.

The sandy horizons extend to a depth of 80 inches or more. Reaction ranges from very strongly acid to medium acid in all horizons. Between depths of 10 and 40 inches the content of silt plus clay is 5 to 10 percent. Some pedons have a few small quartz pebbles but the pebbles make up less than 5 percent, by volume, of the soil.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. It ranges from 2 to 6 inches thick.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 8 or hue of 7.5YR, value of 5 or 6, and chroma of 6 or 8. The lower part of the C horizon has few to common gray, yellow, brown, or white mottles and in a few areas yellowish red mottles. Most of the sand grains between depths of 10 and 40 inches are coated, but below a depth of 40 inches many sand grains are uncoated. Texture is sand or fine sand to a depth of more than 80 inches.

Leon series

Soils of the Leon series are sandy, siliceous, thermic Aeric Haplaquods. These soils are nearly level, poorly

drained, and sandy. They formed in thick beds of acid sandy marine sediment under conditions favorable for the accumulation of an organic pan. These soils are in low positions in the flatwoods. Slopes range from 0 to 2 percent.

Leon soils are near Kureb, Lakeland, Pactolus, and Rutlege soils. Gently sloping to sloping Kureb soils are in broad areas, do not have a spodic horizon, and are excessively drained. Nearly level to gently sloping Lakeland soils are on broad ridges and on hillsides, do not have a spodic horizon, and are excessively drained. Pactolus soils are nearly level to gently sloping, do not have a spodic horizon, and are moderately well drained to somewhat poorly drained. Nearly level Rutlege soils are in low flat depressions and ponded areas, do not have a spodic horizon, and are very poorly drained.

Typical pedon of Leon sand, 0 to 2 percent slopes, in a wooded area, approximately 0.1 mile north of State Highway 191 and 30 yards east of graded road, NW1/4SW1/4 sec. 25, T. 2 S., R. 28 W.:

A1—0 to 2 inches; very dark gray (10YR 3/1) sand; weak fine granular structure; very friable; many fine and medium roots; many uncoated sand grains; very strongly acid; clear smooth boundary.

A2—2 to 16 inches; grayish brown (10YR 5/2) sand; common medium faint splotches of dark grayish brown (10YR 4/2); single grained; loose; many fine and medium roots; very strongly acid; clear wavy boundary.

B21h—16 to 21 inches; dark reddish brown (5YR 3/2) sand; weak medium subangular blocky structure; friable; many fine and few medium roots; sand grains coated with organic matter; very strongly acid; gradual wavy boundary.

B22h—21 to 25 inches; dark brown (7.5YR 3/2) sand; common medium distinct mottles of dark reddish brown (5YR 3/2); weak fine subangular blocky structure; friable; common fine roots; sand grains coated with organic matter; very strongly acid; gradual wavy boundary.

B3—25 to 32 inches; brown (10YR 5/3) sand; common medium distinct vertical tongues of dark brown (7.5YR 3/2); weak fine granular structure; very friable; few fine roots; very strongly acid; clear wavy boundary.

C1—32 to 44 inches; very pale brown (10YR 7/3) sand; common medium distinct dark brown (10YR 3/3) stains along root channels; single grained; loose; few fine roots; many uncoated sand grains; very strongly acid; gradual wavy boundary.

C2—44 to 56 inches; light brownish gray (10YR 6/2) sand; single grained; loose; many uncoated sand grains; very strongly acid; clear wavy boundary.

C3—56 to 80 inches; white (10YR 8/1) sand; single grained; loose; very strongly acid.

This soil is extremely acid to strongly acid throughout. The soil is sand to a depth of 72 inches or more.

The A1 horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or is neutral, value of 4. The A2 horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The A horizon ranges from 10 to 28 inches in thickness.

The Bh horizon has hue of 5YR, value of 2 or 3, and chroma of 1 to 4; hue of 7.5YR, value of 3 or 4, and chroma of 2 or 4; or hue of 10YR, value of 2 to 6, and chroma of 1 to 4. This horizon ranges from 6 to 18 inches in thickness.

The B3 horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 to 4. In some pedons the B3 horizon has mottles in various shades of gray, brown, or yellow. This horizon ranges from 3 to 15 inches in thickness.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 1 to 4. In some pedons the C horizon is mottled in various shades of yellow, brown, and gray. The C horizon is sand to a depth of more than 72 inches.

Lucy series

Soils of the Lucy series are loamy, siliceous, thermic Arenic Paleudults. These soils are nearly level to sloping and well drained. They formed in unconsolidated marine deposits. These soils are on broad and narrow ridgetops and on hillsides in the uplands. Slopes range from 0 to 8 percent.

Lucy soils are near Dothan, Fuquay, Orangeburg, Red Bay, and Troup soils. Dothan soils are on broad and narrow ridgetops and hillsides and have an A horizon less than 20 inches thick and a Bt horizon that is with more than 5 percent plinthite. Fuquay soils are on broad and narrow ridgetops and hillsides and contain more than 5 percent plinthite. Orangeburg soils are on broad and narrow ridgetops and hillsides and have an A horizon less than 20 inches thick. Nearly level and gently sloping Red Bay soils are in broad areas and have an A horizon less than 20 inches thick. Troup soils are in broad, nearly level to gently sloping areas and on hillsides and have a sandy A horizon more than 40 inches thick.

Typical pedon of Lucy loamy sand, 0 to 5 percent slopes, in a cultivated area, approximately 0.25 mile south of State Highway 182 on West Florida Agricultural Experiment Station, NW1/4NE1/4 sec. 16, T. 3 N., R. 29 W.:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) loamy sand; weak fine granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.

A2—10 to 18 inches; brown (7.5YR 4/4) loamy sand; weak fine granular structure; very friable; few fine roots; strongly acid; gradual smooth boundary.

A3—18 to 26 inches; yellowish red (5YR 4/6) loamy sand; weak fine granular structure; very friable; few fine roots; strongly acid; gradual smooth boundary.
B1—26 to 34 inches; yellowish red (5YR 4/8) sandy loam; weak medium subangular blocky structure; very friable; strongly acid; gradual smooth boundary.
B21t—34 to 41 inches; red (2.5YR 4/8) sandy loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid; gradual smooth boundary.
B22t—41 to 80 inches; red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; few thin discontinuous clay films on ped faces; strongly acid.

The solum is more than 60 inches thick. Reaction ranges from very strongly acid to strongly acid in all horizons.

The A1 or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3 or hue of 7.5YR, value of 3, and chroma of 2. It ranges from 5 to 11 inches in thickness. The A2 horizon has hue of 10YR, value of 4 to 6, and chroma of 3 to 8 or hue of 7.5YR, value of 4 or 5, and chroma of 4 to 8. The A2 horizon ranges from 6 to 22 inches in thickness. The A3 horizon, where present, has hue of 5YR, value of 4 or 5, and chroma of 6 or 8. The A horizon ranges from 20 to 40 inches in thickness.

The B1 horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8. It ranges from 4 to 15 inches in thickness. Texture is sandy loam or sandy clay loam.

The B2t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. In a few pedons the lower part of the B2t horizon has few to common mottles of strong brown or yellowish red. The Bt horizon is usually free of plinthite, but in a few pedons it has less than 5 percent, by volume. The B2t horizon is dominantly sandy clay loam but ranges from sandy loam to clay loam. Clay content ranges from 20 to 30 percent.

Lynchburg series

Soils of the Lynchburg series are fine-loamy, siliceous, thermic Aeric Paleaquults. These soils are nearly level and somewhat poorly drained. They formed in thick beds of loamy marine deposits. These soils are along narrow drainageways, around depressions, and on low flats between small streams. Slopes range from 0 to 2 percent.

Lynchburg soils are near Angie Variant, Dothan, Escambia, Johns, and Rains soils. Angie Variant soils are moderately well drained and contain more than 35 percent clay in the upper 20 inches of the B horizon. Dothan soils are on broad and narrow ridgetops and hillsides, are better drained, and have a Bt horizon that is more than 5 percent plinthite. Escambia soils have less than 18 percent clay in the Bt horizon and more than 5 percent plinthite above a depth of 60 inches. Johns soils are on stream terraces; the solum is 20 to 40 inches thick. Nearly level Rains soils are on low flats and depressions and are gray in 60 percent or more of the soil between the base of the A1 or Ap horizon and a depth of 30 inches.

Typical pedon of Lynchburg fine sandy loam, in a wooded area, approximately 0.25 mile south of McDavid Creek and 50 yards west of graded road, SE1/4SW1/4 sec. 20, T. 4 N., R. 30 W.:

A1—0 to 4 inches; very dark gray (10YR 3/1) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.
A2—4 to 9 inches; light yellowish brown (2.5Y 6/4) loam; weak fine granular structure; very friable; many fine and few medium roots; strongly acid; gradual smooth boundary.
B1—9 to 17 inches; light yellowish brown (2.5Y 6/4) loam; common fine distinct yellowish brown (10YR 5/6) and few fine distinct gray (10YR 5/1) mottles; weak fine subangular blocky structure; friable; few fine and medium roots; strongly acid; gradual smooth boundary.
B21t—17 to 25 inches; light yellowish brown (2.5Y 6/4) loam; common medium distinct gray (10YR 6/1), common fine distinct red (2.5YR 4/8), and few fine distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.
B22t—25 to 44 inches; mottled brownish yellow (10YR 6/6), gray (10YR 5/1, 6/1), light yellowish brown (2.5Y 6/4), red (2.5YR 4/8), and strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; slightly sticky; strongly acid; gradual wavy boundary.
B23t—44 to 60 inches; mottled brownish yellow (10YR 6/8), gray (10YR 6/1), strong brown (7.5YR 5/8), and yellowish red (5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; firm; strongly acid; gradual smooth boundary.
B24t—60 to 80 inches; mottled brownish yellow (10YR 6/8), gray (10YR 6/1), strong brown (7.5YR 5/8), and yellowish red (5YR 4/6) clay loam; moderate medium subangular blocky structure; firm; strongly acid.

The solum is more than 60 inches thick. Reaction ranges from strongly acid to extremely acid in all horizons except where the soil has been limed.

The Ap or A1 horizon has hue of 10YR or 2.5Y or is neutral and has value of 2 to 4 and chroma of less than 2. It ranges from 3 to 9 inches in thickness. The A2 horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. It ranges from 3 to 9 inches in thickness. The A2 horizon is fine sandy loam, sandy loam, loam, or loamy fine sand.

The B1 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. It has few to common mottles in shades of gray, brown, and yellow. It ranges from 4 to 10 inches in thickness. The texture is loam, sandy loam, or fine sandy loam.

The B21t horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. It has few to common mottles in shades of red, brown, yellow, and gray. It ranges from 4 to 11 inches in thickness. The B22t, B23t, and B24t horizons are mottled in various shades of gray, yellow, brown, and red. The B2t horizon is loam, sandy loam, sandy clay loam, or clay loam. Gray mottles with chroma of 2 or less are in the upper 10 inches of the B horizon. The mottles increase in size and intensity with depth. The upper 20 inches of the B horizon is 18 to 35 percent clay.

Maxton series

Soils of the Maxton series are fine-loamy over sandy or sandy-skeletal, siliceous, thermic Typic Hapludults. These soils are gently sloping and well drained. They formed in loamy marine and fluvial deposits. These soils are on stream terraces, primarily along the larger streams. Most areas of this soil are at the higher elevations adjacent to the Escambia River. Slopes range from 2 to 5 percent.

Maxton soils are near Johns, Kalmia, Lakeland, Lucy, Orangeburg, and Troup soils. Johns soils are not as well drained and have gray mottles or are dominantly gray in the Bt horizon. Kalmia soils are yellower in the subsoil. Lakeland soils are on broad and narrow ridgetops and side slopes and are sandy to a depth of more than 80 inches. Lucy soils are on broad and narrow ridgetops and hillsides, have a sandy A horizon more than 20 inches thick, and have a thicker solum. Orangeburg and Troup soils are on broad and narrow ridgetops and on hillsides and have a thicker solum.

Typical pedon of Maxton loamy fine sand, 2 to 5 percent slopes, in a wooded area, approximately 0.75 mile east of Escambia River and 25 yards east of graded road, NW1/4SE1/4 sec. 18, T. 3 N., R. 30 W.:

A1—0 to 6 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; gradual smooth boundary.

A2—6 to 10 inches; dark yellowish brown (10YR 4/4) loamy fine sand; weak medium granular structure; very friable; common fine and medium roots; strongly acid; gradual smooth boundary.

B11—10 to 14 inches; strong brown (7.5YR 5/6) very fine sandy loam; weak medium granular structure; very friable; common fine and few medium roots; strongly acid; gradual wavy boundary.

B12—14 to 19 inches; strong brown (7.5YR 5/6) very fine sandy loam; weak fine subangular blocky structure; friable; common fine and few medium roots; sand grains bridged and coated with clay; strongly acid; gradual smooth boundary.

B2t—19 to 32 inches; yellowish red (5YR 4/8) sandy clay loam; weak medium subangular blocky structure; friable; common fine roots; sand grains bridged and coated with clay; strongly acid; gradual smooth boundary.

B3—32 to 38 inches; yellowish red (5YR 5/8) very fine sandy loam; weak fine subangular blocky structure; friable; few fine roots; strongly acid; clear smooth boundary.

IIC1—38 to 59 inches; brownish yellow (10YR 6/6) sand; single grained; loose; common to many uncoated sand grains; strongly acid; gradual smooth boundary.

IIC2—59 to 72 inches; white (10YR 8/1) fine sand; common medium distinct brownish yellow (10YR 6/8), common medium prominent strong brown (7.5YR 5/6), and few fine distinct pale brown (10YR 6/3) mottles; single grained; loose; strongly acid.

The solum ranges from 20 to 40 inches in thickness. Reaction is strongly acid or very strongly acid in all horizons except the A horizon where the soil has been limed. Content of mica flakes is none to few.

The A1 horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. It ranges from 3 to 10 inches in thickness. Where the A1 horizon has value of 3, the horizon is less than 6 inches thick. The A2 horizon has hue of 10YR, value of 4 to 6, and chroma of 4 or 6 or hue of 7.5YR, value of 5, and chroma of 6. It ranges from 2 to 8 inches in thickness. The A2 horizon is dominantly loamy fine sand but ranges to fine sandy loam.

The B1 horizon has hue of 7.5YR, value of 5, and chroma of 4 to 8 or hue of 5YR, value of 4 to 6, and chroma of 4 to 8. It ranges from 3 to 7 inches in thickness. The texture is very fine sandy loam, fine sandy loam, or sandy clay loam.

The B21t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8 or hue of 7.5YR, value of 5, and chroma of 6. The B22t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. In some pedons the lower part of the B2t horizon has few to common mottles in various shades of red, brown, and yellow. Thickness ranges from 8 to 20 inches. The texture is very fine sandy loam, fine sandy loam, or sandy clay loam.

The B3 horizon has hue of 5YR, value of 4 or 5, and chroma of 6 or 8 or hue of 7.5YR, value of 5, and chroma of 6 or 8. In some pedons the B3 horizon has few to common mottles in various shades of red, brown, or yellow. Thickness ranges from 3 to 8 inches. The texture is very fine sandy loam, fine loam, or sandy clay loam.

The IIC horizon has hue of 10YR, value of 6 to 8, and chroma of 1 to 8; hue of 7.5YR, value of 5 or 6, and chroma of 6 or 8; or hue of 5YR, value of 5, and chroma

of 8. In some pedons this horizon has mottles in various shades of gray, yellow, brown, or red. The texture ranges from sand to loamy sand.

Mulat series

Soils of the Mulat series are coarse-loamy, siliceous, thermic Typic Ochraquults. These soils are nearly level and poorly drained. They formed in thick beds of loamy acid marine sediment. These soils are in low lying areas in the flatwoods. Slopes range from 0 to 1 percent.

Mulat soils are near Garcon, Lynchburg, Pactolus, Rains, and Rutlege soils. Garcon and Pactolus soils are somewhat poorly drained. Lynchburg and Rains soils have an argillic horizon that begins between a depth of 10 to 20 inches and a depth of more than 60 inches. Rutlege soils are sandy to a depth of more than 80 inches and have an umbric epipedon.

Typical pedon of Mulat loamy fine sand where slope is 0.5 percent, approximately 200 feet east of State Highway 281 and 2.25 miles south of Interstate 10, S1/2 sec. 15, T. 1 S., R. 28 W.:

A11—0 to 4 inches; black (10YR 2/1) loamy fine sand; weak medium granular structure; very friable; many fine and few medium roots; strongly acid; gradual smooth boundary.

A12—4 to 10 inches; dark gray (10YR 4/1) loamy fine sand; common fine distinct brown (7.5YR 4/4) root stains; few fine faint very dark gray mottles; weak fine granular structure; very friable; common fine and few medium roots; strongly acid; gradual smooth boundary.

A21—10 to 17 inches; grayish brown (10YR 5/2) fine sand; common medium distinct dark yellowish brown (10YR 4/4) and few fine distinct brown (7.5YR 4/4) mottles; single grained; nonsticky; few fine roots; strongly acid; gradual smooth boundary.

A22—17 to 27 inches; light brownish gray (10YR 6/2) sand; common medium distinct yellowish brown (10YR 5/6) and few fine distinct brown (7.5YR 4/4) mottles; single grained; nonsticky; few very fine roots; strongly acid; gradual wavy boundary.

B21tg—27 to 34 inches; gray (10YR 5/1) fine sandy loam; common coarse distinct yellowish brown (10YR 5/6) and common coarse faint mottles of grayish brown (10YR 5/2); weak medium subangular blocky structure; slightly sticky; few very fine roots; sand grains bridged and coated with clay; strongly acid; gradual smooth boundary.

B22tg—34 to 49 inches; gray (10YR 5/1) fine sandy loam; common medium distinct yellowish brown (10YR 5/6) and common medium faint dark gray (10YR 4/1) mottles; weak medium subangular blocky structure; slightly sticky; few very fine roots; sand grains bridged and coated with clay; strongly acid; clear smooth boundary.

C1g—49 to 57 inches; pinkish gray (7.5YR 6/2) sand; few fine faint light brownish gray mottles; single grained; nonsticky; strongly acid; gradual smooth boundary.

C2g—57 to 71 inches; light brownish gray (10YR 6/2) sand; few fine faint pinkish gray mottles; single grained; nonsticky; strongly acid; gradual smooth boundary.

C3g—71 to 80 inches; gray (10YR 5/1) fine sand; common medium faint dark gray (N 4/) mottles; single grained; nonsticky; strongly acid.

The solum ranges from 40 to 60 inches in thickness. Reaction ranges from very strongly acid to strongly acid in the A and B horizons and from extremely acid to strongly acid in the C horizon.

The A1 horizon has hue of 10YR, value of 2 to 4, and chroma of 1. Thickness is 5 to 10 inches. The A2 horizon has hue of 10YR, value of 4 to 6, and chroma of 2. It has mottles in shades of yellow or brown. Texture of the A2 horizon is loamy sand, loamy fine sand, fine sand, or sand. The A horizon ranges from 20 to 40 inches in thickness.

The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It has few to common mottles in shades of red, yellow, brown, and gray. Texture is sandy loam, fine sandy loam, or sandy clay loam. The weighted average clay content ranges from 16 to 22 percent. Silt content is less than 20 percent.

The Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3 or hue of 7.5YR, value of 6, and chroma of 2. It has mottles in various shades of brown, yellow, and gray. The texture is sand or fine sand.

Orangeburg series

Soils of the Orangeburg series are fine-loamy, siliceous, thermic Typic Paleudults. These soils are nearly level to strongly sloping, well drained, and loamy. They formed in thick beds of loamy marine deposits. These soils are on broad and narrow ridgetops and on hillsides in the uplands. Slopes range from 0 to 12 percent, but are mainly 0 to 8 percent.

Orangeburg soils are near Dothan, Fuquay, Lucy, and Red Bay soils. Dothan soils are on broad and narrow ridgetops and hillsides; they have a yellowish brown subsoil that contains more than 5 percent plinthite above a depth of 60 inches. Fuquay soils are on broad and narrow ridgetops and hillsides, they have an A horizon more than 20 inches thick, a yellowish brown Bt horizon, and more than 5 percent plinthite in the lower part of the Bt horizon. Lucy soils are on broad and narrow ridgetops and hillsides and have a thicker A horizon. Red Bay soils have a dark reddish brown A horizon and a dark red B2t horizon.

Typical pedon of Orangeburg sandy loam, 0 to 2 percent slopes, in a cultivated area, approximately 3/4 mile

east of State Highway 87 and 35 yards east of graded road, SW1/4SE1/4 sec. 27, T. 4 N., R. 28 W.:

Ap—0 to 8 inches; brown (10YR 4/3) sandy loam; weak medium granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.
B1—8 to 14 inches; brown (7.5YR 4/4) sandy loam; weak medium granular structure; very friable; common fine roots; strongly acid; gradual smooth boundary.
B21t—14 to 25 inches; red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; strongly acid; gradual smooth boundary.
B22t—25 to 47 inches; dark red (2.5YR 3/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; thin clay films on ped faces; strongly acid; gradual wavy boundary.
B23t—47 to 73 inches; dark red (2.5YR 3/6) sandy clay loam; few fine distinct mottles of strong brown (7.5YR 5/6); moderate medium subangular blocky structure; friable; few thin clay films on ped faces; strongly acid.

The solum is more than 60 inches thick. Reaction ranges from very strongly acid to strongly acid in all horizons except in the A horizon where the soil has been limed. Content of strongly cemented iron oxide concretions ranges from 0 to 5 percent, by volume, throughout the solum.

The A1 or Ap horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 to 4. This horizon ranges from 4 to 9 inches in thickness. The A2 horizon, where present, has hue of 10YR or 7.5YR, value of 5 to 6, and chroma of 3 to 6. This horizon ranges from 3 to 9 inches in thickness. The texture of the A2 horizon is dominantly sandy loam but ranges to loamy sand.

The B1 horizon has hue of 10YR, 7.5YR, or 5YR, value of 4 to 6, and chroma of 4 to 8. The texture is dominantly sandy loam but ranges to sandy clay loam. The B1 horizon ranges from 3 to 12 inches in thickness.

The B21t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8. The texture is dominantly sandy clay loam but ranges to sandy loam. The B22t and B23t horizons have hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8 or hue of 2.5YR, value of 3, and chroma of 6. Texture is dominantly sandy clay loam but may range to sandy clay that is less than 45 percent clay. However, the clay content is generally 20 to 35 percent. The lower part of the B2t horizon may have few to common mottles of red, yellow, or brown.

Ortega series

Soils of the Ortega series are thermic, uncoated Typic Quartzipsamments. These soils are nearly level to gently sloping, moderately well drained, and sandy. They formed in sandy marine deposits. These soils are in nearly level to gently sloping, broad areas that are higher than the adjacent flatwoods. Slopes range from 0 to 5 percent.

Ortega soils are near Kureb, Lakeland, Leon, Pactolus, and Rutlege soils. Kureb and Lakeland soils are excessively drained. Leon soils have a spodic horizon and are poorly drained. Pactolus soils have chroma of 2 or less between depths of 20 and 40 inches and are seasonally wet. Rutlege soils have an umbric epipedon and are very poorly drained.

Typical pedon of Ortega sand, 0 to 5 percent slopes, in a wooded area, approximately 0.5 mile south of State Highway 399 and 150 feet east of State Highway 87, NW1/4NW1/4 sec. 16, T. 2 S., R. 26 W.:

A1—0 to 4 inches; very dark gray (10YR 3/1) sand rubbed, salt-and-pepper appearance unrubbed; single grain; loose; common very fine and few fine roots; very strongly acid; clear wavy boundary.
C1—4 to 45 inches; brownish yellow (10YR 6/6) sand; single grain; loose; very strongly acid; gradual wavy boundary.
C2—45 to 52 inches; very pale brown (10YR 7/4) sand; common medium faint light gray (10YR 7/1) and few fine faint brownish yellow mottles; single grain; loose; very strongly acid; gradual smooth boundary.
C3—52 to 88 inches; white (10YR 8/1) sand; many coarse faint very pale brown (10YR 7/3), few fine prominent yellowish red (5YR 5/8), and few fine distinct reddish yellow (7.5YR 6/8) mottles; single grain; nonsticky; strongly acid.

The sandy horizons extend to a depth greater than 80 inches. Reaction normally ranges from very strongly acid to strongly acid; however, a few pedons adjacent to salt or brackish water are neutral in the lower part of the C horizon. Content of silt plus clay between depths of 10 to 40 inches is less than 5 percent.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 3 to 5 inches in thickness.

The C1 and C2 horizons have hue of 10YR, value of 5 to 7, and chroma of 4 to 6. Few to common, fine to coarse mottles or pockets of white or light gray uncoated sand grains occur in the C1 horizon above a depth of 40 inches but are not indicative of wetness. Mottles in shades of brown, yellow, or gray occur below a depth of 40 inches and are indicative of a fluctuating water table.

The C3 horizon has hue of 10YR, value of 5 to 7, and chroma of 6 to 8; hue of 2.5Y, value of 7, and chroma of 4; or hue of 10YR, value of 7 or 8; and chroma of 1 or 2. This horizon has mottles in shades of red, brown, yellow, and gray.

The C4 horizon, where present, has hue of 10YR, value of 6 to 8, and chroma of 1 or 2 and mottles in shades of red, yellow, and gray. Few to common parti-

cles of dark colored heavy minerals are present in this horizon in some pedons.

Pactolus series

Soils of the Pactolus series are thermic coated Aquic Quartzipsamments. These soils are nearly level to gently sloping, moderately well drained to somewhat poorly drained, and sandy. They formed in thick loamy sand marine and fluvial deposits. These soils are on low positions in the uplands. Slopes range from 0 to 5 percent.

Pactolus soils are near Albany, Lakeland, Leon, Rutlege, and Troup soils. Albany soils have a sandy loam or sandy clay loam Bt horizon below a depth of 40 inches. Lakeland soils are on broad ridges and hillsides and are excessively drained. Leon soils are more poorly drained and have a Bh horizon. Rutlege soils are very poorly drained and have a black surface layer 10 or more inches thick. Troup soils are in nearly level areas and on hillsides, are better drained, and have a red Bt horizon below a depth of 40 inches.

Typical pedon of Pactolus loamy sand, 0 to 5 percent slopes, approximately 100 yards north of State Highway 182 and 75 yards east of graded road, SE1/4SE1/4 sec. 7, T. 3 N., R. 29 W.:

A11—0 to 5 inches; very dark gray (10YR 3/1) loamy sand; weak fine granular structure; loose; many fine and few medium roots; strongly acid; gradual smooth boundary.

A12—5 to 8 inches; dark grayish brown (10YR 4/2) loamy sand; common medium distinct very dark gray (10YR 3/1) streaks along root channels; weak fine granular structure; loose; many fine and few medium roots; strongly acid; gradual wavy boundary.

C1—8 to 17 inches; light yellowish brown (2.5Y 6/4) sand; few fine distinct dark grayish brown (10YR 4/2) streaks along root channels; single grain; loose; common fine and few medium roots; strongly acid; gradual wavy boundary.

C2—17 to 30 inches; brownish yellow (10YR 6/6) sand; few fine faint yellowish brown and common fine faint light gray mottles; single grain; loose; few fine roots; strongly acid; gradual wavy boundary.

C3—30 to 52 inches; coarsely mottled brownish yellow (10YR 6/6, 6/8), yellowish brown (10YR 5/6), light gray (10YR 7/2) and very pale brown (10YR 7/4) sand; single grain; loose, nonsticky; strongly acid; gradual wavy boundary.

C4—52 to 80 inches; white (10YR 8/2) sand; few medium distinct yellow (10YR 7/8) and few fine distinct very pale brown (10YR 7/4) mottles; single grain; loose, nonsticky; strongly acid.

The sandy horizons extend to a depth of 80 inches or more. Reaction ranges from strongly acid to very strongly acid throughout the profile except where the surface layer has been limed. The content of silt plus clay between depths of 10 and 40 inches is 10 to 25 percent.

The A1 or Ap horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2 or hue of 2.5Y, value of 4 or 5, and chroma of 2. It ranges from 5 to 10 inches in thickness.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 1 to 8 or hue of 2.5Y, value of 6 or 7, and chroma of 4 to 8. It has mottles in shades of brown, yellow, red, and gray. In many pedons the lower part of the C horizons has coarse mottles in various shades of brown, yellow, red, and gray. Uncoated sand grains are in the lower part of the C horizon in most pedons. Texture of the C horizon is sand, loamy sand, fine sand, or loamy fine sand.

Pamlico series

Soils of the Pamlico series are sandy or sandy-skeletal, siliceous, dysic, thermic Terric Medisaprists. These soils are very poorly drained and organic. They formed by the decomposition of woody and herbaceous plant remains. These soils are on flood plains of major streams and in large hardwood swamps of the Coastal Plain. Water is at or near the surface throughout the year. Slopes are less than 2 percent.

Pamlico soils are near Bibb, Bohicket, Chewacla, Dorovan, Lenoir, Pactolus, Pickney, Riverview, and Rutlege soils. Bibb, Bohicket, Chewacla, Lenoir, Pactolus, Pickney, Riverview and Rutlege soils are mineral. Dorovan soils have organic material 51 or more inches thick. Bohicket soils have a high sulfur content in the upper 40 inches.

Pamlico soils are mapped only in association with Dorovan soils.

Typical pedon of Pamlico muck in an area of Dorovan-Pamlico association, where slope is 0.5 percent, in a hardwood swamp, approximately 2.6 miles west of Florida Highway 191 and 0.1 mile south of Trail road, SE1/4SW1/4 sec. 21, T. 1 N., R. 28 W.:

Oa1—0 to 15 inches; very dark brown (10YR 2/2) muck; about 30 percent fiber, 15 percent rubbed; massive; nonsticky; common fine and few medium roots; very strongly acid; gradual wavy boundary.

Oa2—15 to 37 inches; black (10YR 2/1) muck; about 20 percent fiber, less than 10 percent rubbed; massive; nonsticky; few fine roots; very strongly acid; gradual wavy boundary.

IICg—37 to 60 inches; dark gray (10YR 4/1) sand; single grained; nonsticky; few fine roots; very strongly acid.

The organic layers range from 16 to 51 inches in thickness. Reaction is very strongly acid in all horizons.

The Oe horizon, where present, has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 to 3. It is 20 to 70 percent fiber after rubbing. It is less than 15 percent

mineral material. This horizon ranges from 0 to 11 inches in thickness.

The Oa horizons have hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 3 or less. Fiber content is 15 to 40 percent unrubbed and 5 to 15 percent rubbed. These horizons are less than 10 percent mineral material.

The IICg horizon has hue of 10YR, value of 3 to 8, and chroma of 1 to 4. Texture is sand or sandy loam. This horizon extends to a depth of more than 65 inches.

Pickney series

Soils of the Pickney series are sandy, siliceous, thermic Cumulic Humaquepts. These soils are nearly level and very poorly drained. They formed in sandy marine sediment. These soils are in low lying areas and hardwood swamps of the lower Coastal Plain. Slopes are less than 2 percent.

Pickney soils are near Dorovan, Leon, Ortega, Pactolus, Pamlico, and Rutlege soils. Dorovan and Pamlico soils are in low lying areas; they have an organic surface layer more than 20 inches thick. Leon soils are in broad low positions, have a spodic horizon above a depth of 30 inches, and are poorly drained. Ortega soils are at higher elevations and have a water table between depths of 40 to 60 inches. Pactolus soils are in low positions on uplands and are better drained. Nearly level Rutlege soils are in low, flat depressions and ponded areas and have an umbric epipedon less than 24 inches thick.

Typical pedon of Pickney loamy sand in a hardwood swamp, approximately 10 yards east of graded road, NW1/4NW1/4 sec. 21, T. 2 S., R. 27 W.:

A11—0 to 20 inches; black (10YR 2/1) loamy sand; weak fine granular structure; slightly sticky; many fine and medium roots; extremely acid; gradual smooth boundary.

A12—20 to 35 inches; black (10YR 2/1) loamy sand; single grain; slightly sticky; common fine and medium roots; extremely acid; gradual smooth boundary.

A13—35 to 58 inches; very dark gray (10YR 3/1) loamy sand; single grain; nonsticky; few fine and medium roots; extremely acid; clear smooth boundary.

C1—58 to 65 inches; grayish brown (10YR 5/2) sand; single grain; nonsticky; strongly acid; clear smooth boundary.

C2—65 to 70 inches; mottled dark brown (10YR 3/3), very dark grayish brown (10YR 3/2), and very dark gray (10YR 3/1) sand; single grain; nonsticky; strongly acid.

Reaction ranges from very strongly acid to extremely acid in all horizons.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or is neutral and has value of 2. The A horizon ranges from 24 to 60 inches in thickness.

The C horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. In some pedons the lower part of the C horizon is mottled in shades of brown and gray. The C horizon is loamy sand or sand.

Rains series

Soils of the Rains series are fine-loamy, siliceous, thermic Typic Paleaquults. These soils are nearly level and poorly drained. They have a loamy subsoil. These soils formed in thick beds of loamy marine sediment. These soils are in ponded areas or low lying positions on the Coastal Plain. Slopes range from 0 to 2 percent.

Rains soils are near Angie Variant, Dothan, Escambia, Johns, and Lynchburg soils. Angie Variant soils are moderately well drained and contain more than 35 percent clay in the upper 20 inches of the Bt horizon. Dothan soils are on broad ridgetops and hillsides, are better drained, and contain more than 5 percent plinthite in the Bt horizon. Escambia soils have more than 5 percent plinthite, are better drained, and have less than 18 percent clay in the Bt horizon. Johns soils are on stream terraces and have a solum 20 to 40 inches thick. Lynchburg soils are at slightly higher elevations, are somewhat poorly drained, and have higher chroma between the base of the horizon and a depth of 30 inches.

Typical pedon of Rains fine sandy loam, approximately 1.0 mile northeast of Brownsdale and 0.5 mile east of State Highway 197, NW1/4NW1/4 sec. 2, T. 4 N., R. 30 W.:

A1—0 to 5 inches; very dark gray (10YR 3/1) fine sandy loam; weak fine granular structure; very friable; many fine roots; very strongly acid; gradual smooth boundary.

B1—5 to 9 inches; dark gray (10YR 4/1) fine sandy loam; weak medium subangular blocky structure; friable; many fine and few medium roots; very strongly acid; gradual smooth boundary.

B21tg—9 to 28 inches; gray (10YR 5/1) sandy clay loam; few dark gray mottles along root channels; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; gradual wavy boundary.

B22tg—28 to 50 inches; gray (10YR 6/1) sandy clay loam; few fine faint light gray and common medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

B23tg—50 to 63 inches; gray (10YR 6/1) sandy clay loam; common medium prominent red (2.5YR 4/8) and common medium distinct strong brown (7.5YR 5/6) and brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; very strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid throughout the profile.

The A1 horizon is neutral and has value of 2 or 3, or it has hue of 10YR, value of 3 or 4, and chroma of 1. The A2 horizon, where present, has hue of 10YR, value of 5 or 6, and chroma of 1. Texture is loamy fine sand. The A horizon ranges from 5 to 14 inches in thickness.

The B1 horizon, where present, has hue of 10YR, value of 4 or 5, chroma of 1 and 2. Texture is fine sandy loam or sandy loam. This horizon ranges from 4 to 7 inches in thickness.

The B21t and B22t horizons have hue of 10YR, value of 4 to 6, and chroma of 1 or 2 and mottles in shades of yellow, red, and brown. The B23t horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2 and mottles in shades of yellow, brown, or red. The B2t horizon is sandy clay loam or clay loam. The upper 20 inches of the Bt horizon contains 18 to 35 percent clay.

The C horizon, where present, has hue of 10YR, value of 5 to 7, and chroma of 1. Texture is sandy loam, sandy clay loam, or sandy clay.

Red Bay series

Soils of the Red Bay series are fine-loamy, siliceous, thermic Rhodic Paleudults. These soils are nearly level to gently sloping, well drained and loamy. They formed in thick beds of loamy marine deposits. These soils are in broad, nearly level and gently sloping areas in the uplands. Slopes range from 0 to 5 percent.

Red Bay soils are near Dothan, Lucy, and Orangeburg soils. Dothan soils are on broad and narrow ridgetops and on hillsides and have a Bt horizon that contains more than 5 percent plinthite. Lucy soils are on broad and narrow ridgetops and hillsides and have an A horizon more than 20 inches thick. Orangeburg soils are on broad and narrow ridgetops and on hillsides, have a lighter colored A horizon, do not have a horizon that is dark red throughout.

Typical pedon of Red Bay sandy loam, 0 to 2 percent slopes, in a pasture, approximately 220 yards south of State Highway 89, and 1/2 mile southeast of Pineview Church, NW1/4NW1/4 sec. 1, T. 3 N., R. 29 W.:

Ap—0 to 8 inches; dark reddish brown (5YR 3/2) sandy loam; weak fine granular structure; very friable; many fine roots; slightly acid; clear smooth boundary.

B1—8 to 14 inches; dark reddish brown (2.5YR 3/4) sandy clay loam; common fine distinct root channels and insect burrows filled with dark reddish brown (5YR 3/2) material; weak medium subangular blocky structure; friable; common fine roots; sand grains coated and bridged with clay; slightly acid; gradual smooth boundary.

B21t—14 to 51 inches; dark red (2.5YR 3/6) sandy clay loam; weak medium subangular blocky structure; friable; common fine roots; few thin clay films on peds; sand grains coated and bridged with clay; strongly acid; gradual smooth boundary.

B22t—51 to 80 inches; dark red (2.5YR 3/6) sandy clay loam; weak medium subangular blocky structure; friable; very few thin clay films on peds; sand grains coated and bridged with clay; strongly acid.

The solum is more than 60 inches thick. Reaction ranges from very strongly acid to strongly acid in all horizons except in the A horizon where the soil has been limed.

The A1 or Ap horizon has hue of 7.5YR, value of 3, and chroma of 2; hue of 5YR, value of 3, and chroma of 2 to 4; or hue of 2.5YR value of 3, and chroma of 4. The A horizon ranges from 2 to 12 inches in thickness.

The B1 horizon has hue of 5YR, value of 3, and chroma of 3 or 4; hue of 2.5YR, value of 3, and chroma of 4 to 6; or hue of 10R, value of 3, and chroma of 6. It ranges from 4 to 9 inches in thickness. Texture is dominantly sandy clay loam but ranges to sandy loam.

The B21t and B22t horizons have hue of 2.5YR or 10R, value of 3, and chroma of 6. Texture is mainly sandy clay loam, but in a few pedons it ranges to sandy loam in the lower part. The upper 20 inches of the B2t horizon commonly is about 25 percent clay.

Riverview series

Soils of the Riverview series are fine-loamy, mixed, thermic Fluventic Dystrochrepts. These soils are nearly level and well drained. They formed in stream alluvium. These soils are on flood plains along stream terraces. Slopes range from 0 to 2 percent.

Riverview soils are near Chewacla, Wahee, Kalmia, and Maxton soils. Chewacla and Wahee soils are on the lower elevations of the flood plain and are more poorly drained. Kalmia and Maxton soils are on low terraces of larger streams and have more distinct evidence of clay accumulation in the subsoil.

Riverview soils are mapped only in association with Chewacla and Wahee soils.

Typical pedon of Riverview silt loam in wooded area of Chewacla-Wahee-Riverview association, approximately 0.2 mile east of Escambia River and 0.5 mile south of Alabama State Line, NW1/4NW1/4 sec. 34, T. 6 N., R. 29 W.:

A1—0 to 4 inches; dark brown (7.5YR 3/2) silt loam; weak fine granular structure; very friable; many fine and few medium roots; very strongly acid; gradual wavy boundary.

B21—4 to 14 inches; dark yellowish brown (10YR 3/4) silty clay loam; weak medium subangular blocky structure; friable; many fine and few medium roots; very strongly acid; gradual wavy boundary.

B22—14 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium subangular blocky structure; friable; few fine roots; few mica flakes; very strongly acid; gradual wavy boundary.
B23—24 to 28 inches; dark yellowish brown (10YR 4/4) sandy clay loam; few fine faint brown mottles; weak fine subangular blocky structure; friable; few fine mica flakes; very strongly acid; gradual wavy boundary.
B3—28 to 31 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine subangular blocky structure; very friable; few mica flakes; very strongly acid; gradual wavy boundary.
C1—31 to 36 inches; yellowish brown (10YR 5/6) loamy sand; single grain; loose; very strongly acid; gradual wavy boundary.
C2—36 to 43 inches; yellowish brown (10YR 5/8) sand; single grain; loose; very strongly acid; gradual wavy boundary.
C3—43 to 59 inches; brownish yellow (10YR 6/6) sand; common medium faint yellowish brown (10YR 5/8) and common medium distinct dark yellowish brown (10YR 4/4) and very pale brown (10YR 7/3) mottles; single grain; loose; very strongly acid; gradual wavy boundary.
C4—59 to 64 inches; light yellowish brown (10YR 6/4) sand; common medium faint very pale brown (10YR 7/3) and common medium distinct brownish yellow (10YR 6/6) mottles; single grain; loose; very strongly acid.

The solum ranges from 26 to 40 inches in thickness. Reaction ranges from strongly acid to very strongly acid. Content of mica flakes ranges from few to common.

The A1 horizon has hue of 10YR to 7.5YR, value of 3 to 5, and chroma of 2 to 4. It ranges from 3 to 6 inches in thickness.

The B horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 4 to 8. In some pedons the B horizon has mottles in shades of brown, yellow, or red, and in a few pedons it is mottled with gray below depths of 24 inches. The B2 horizon is silty clay loam, sandy clay loam, loam, or silt loam. The B3 horizon is fine sandy loam, loam, or sandy clay loam.

The C horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 4 to 8. In some pedons it has mottles in various shades of gray, yellow, brown, and red. Texture is fine sandy loam, sandy loam, loamy fine sand, loamy sand, or sand. The C horizon includes strata that range from sandy loam to silty clay loam.

Rutlege series

Soils of the Rutlege series are sandy, siliceous, thermic Typic Humaquepts. These soils are nearly level and very poorly drained. They formed in thick beds of sandy marine sediment. These soils are along small stream bottoms, on low upland flats, and in ponded areas. Slopes range from 0 to 2 percent.

Rutlege soils are near Albany, Dorovan, Leon, Pactolus, Pamlico, and Pickney soils. Albany soils are on low upland ridges, are better drained, and have a Bt horizon. Dorovan and Pamlico soils are on low lying areas and have organic material more than 20 inches thick. Leon soils are in broad, low positions, have a spodic horizon, and are poorly drained. Pactolus soils are in low lying areas, do not have a thick black surface horizon, and are better drained. Pickney soils have an umbric epipedon more than 24 inches thick.

Typical pedon of Rutlege loamy sand, where slope is 1 percent, approximately 100 yards east of State Highway 184 and 125 yards south of East Milton School, NW1/4SE1/4 sec. 2, T. 1 N., R. 28 W.:

A11—0 to 12 inches; black (10YR 2/1) loamy sand; weak fine granular structure; very friable; many fine and common medium roots; very strongly acid; gradual smooth boundary.
A12—12 to 21 inches; very dark gray (10YR 3/1) loamy sand; single grain; loose; nonsticky; few fine roots; very strongly acid; gradual smooth boundary.
Cg—21 to 61 inches; gray (10YR 5/1) sand; single grain; loose; nonsticky; very strongly acid.

The soil ranges from very strongly acid to extremely acid in all horizons.

The A horizon has hue of 10YR or 2.5Y, or is neutral; it has value of 2 or 3 and chroma of less than 2. The A horizon ranges from 10 to 24 inches in thickness.

The Cg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2; has hue of 2.5Y, value of 4 to 6, and chroma of less than 2; or is neutral and has value of 4 to 6. In some pedons the Cg horizon is mottled in shades of yellow, brown, and gray. The Cg horizon extends to a depth of more than 60 inches.

Tifton series

Soils of the Tifton series are fine-loamy, siliceous, thermic Plinthic Paleudults. These soils are nearly level to sloping and well drained. They formed in thick beds of loamy marine deposits. These soils are on broad and narrow ridgetops and on hillsides in the uplands. Slopes range from 0 to 8 percent.

Tifton soils are near Dothan, Fuquay, and Orangeburg soils. Dothan soils are on broad and narrow ridgetops and side slopes and have less than 5 percent strongly cemented iron concretions in all horizons. Fuquay soils are on broad and narrow ridgetops and hillsides, have an A horizon 20 to 40 inches thick, and contain less than 5 percent iron concretions in all horizons. Orangeburg soils are on broad and narrow ridgetops and hillsides, contain less than 5 percent iron concretions and plinthite, and have redder hue in the Bt horizon.

Typical pedon of Tifton sandy loam, 0 to 2 percent slopes, in cultivated area, approximately 0.15 mile west of State Highway 197 and 40 yards north of Trail road, SE1/4SW1/4 sec. 1, T. 3 N., R. 30 W.:

Apcn—0 to 8 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; common fine roots; 10 percent small ironstone concretions; strongly acid; abrupt smooth boundary.

B21tcn—8 to 30 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; estimated 15 percent small ironstone concretions; strongly acid; gradual wavy boundary.

B22tcn—30 to 42 inches; brownish yellow (10YR 6/6) sandy clay loam; few medium distinct strong brown (7.5YR 5/8) and common medium distinct red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; estimated 15 percent small ironstone concretions; about 5 percent plinthite; strongly acid; gradual wavy boundary.

B23tcn—42 to 58 inches; mottled brownish yellow (10YR 6/6, 6/8), strong brown (7.5YR 5/8), yellowish red (5YR 4/8), and dark red (10R 3/6) sandy clay loam; moderate medium subangular blocky structure; friable; estimated 10 percent small ironstone concretions; about 15 percent plinthite; strongly acid; gradual smooth boundary.

B24t—58 to 70 inches; mottled brownish yellow (10YR 6/6, 6/8), very pale brown (10YR 7/3), light gray (10YR 7/1), strong brown (7.5YR 5/8), yellowish red (5YR 5/8), red (2.5YR 4/8), and dark red (10R 3/6) sandy clay; moderate medium subangular blocky structure; friable; estimated 4 percent small ironstone concretions; about 10 percent plinthite; strongly acid.

The solum is 60 inches or more thick. Reaction is strongly acid or very strongly acid throughout the profile except in the A horizon where the soil has been limed. Depth to horizons containing more than 5 percent plinthite ranges from 30 to 48 inches. Strongly cemented iron oxide concretions make up 5 to 15 percent, by volume, of the A horizon and the upper part of the Bt horizon. The concretions range from 1/3 to 3/4 inch in diameter.

The A1 or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It ranges from 4 to 9 inches in thickness. A few pedons have an A2 horizon with hue of 10YR, value of 5 or 6, and chroma of 4. It ranges from 4 to 6 inches in thickness.

The B1cn horizon, where present, has hue of 7.5YR or l0YR, value of 5 or 6, and chroma of 4 to 8. It ranges from 4 to 8 inches in thickness. This horizon ranges from sandy loam to sandy clay loam.

The B21tcn and B22tcn horizons have hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 to 8. The B22tcn horizon has few to common mottles in shades of red, brown, or yellow. The B23tcn and B24tcn horizons are highly mottled in various shades of red, brown, yellow, and gray. In some pedons the B23tcn horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 to 8 and mottles in shades of brown, yellow, red, and gray. The lower part of the B2t horizon contains 5 to 15 percent, by volume, firm brittle plinthite. The upper 20 inches of the Bt horizon is 20 to 35 percent clay and less than 20 percent silt. The texture of the B2t horizon is dominantly sandy clay loam but ranges to sandy clay in the lower part. This horizon extends to a depth of more than 60 inches.

Troup series

Soils of the Troup series are loamy, siliceous, thermic Grossarenic Paleudults. These soils are nearly level to steep and are well drained. They formed in thick beds of sandy and loamy marine deposits. These soils are on tops and sides of broad and narrow ridges on uplands. Slopes range from 0 to 35 percent but are mostly 0 to 12 percent.

Troup soils are near Bonifay, Fuquay, Lakeland, Lucy, and Pactolus soils. Bonifay soils are on broad and narrow ridgetops and have a Bt horizon that contains more than 5 percent plinthite above a depth of 60 inches. Fuquay soils are on broad and narrow ridgetops and hillsides; they have a sandy A horizon 20 to 40 inches thick and have more than 5 percent plinthite in the Bt horizon. Lakeland soils are on broad, nearly level to gently sloping ridges and hillsides and do not have a Bt horizon. Lucy soils are also on broad and narrow ridgetops and hillsides and have a sandy A horizon 20 to 40 inches thick. Pactolus soils are on low positions on uplands, are less well drained, and do not have a Bt horizon.

Typical pedon of Troup loamy sand, 0 to 5 percent slopes, in a wooded area approximately 0.5 mile south of State Highway 191 and 0.13 mile east of paved road, NW1/4NW1/4 sec. 30, T. 2 N., R. 28 W.:

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) loamy sand; single grain; loose; many fine and common medium roots; strongly acid; clear wavy boundary.

A21—3 to 21 inches; dark yellowish brown (10YR 4/4) loamy sand; single grain; loose; many fine and few medium roots; strongly acid; gradual wavy boundary.

A22—21 to 39 inches; strong brown (7.5YR 5/6) loamy sand; single grain; loose; few fine and medium roots; strongly acid; gradual wavy boundary.

A23—39 to 55 inches; yellowish red (5YR 5/6) sand; single grain; loose; few fine roots; common pale brown (10YR 6/3) uncoated sand grains; strongly acid; gradual wavy boundary.

B21t—55 to 60 inches; yellowish red (5YR 4/6) sandy loam; weak medium subangular blocky structure;

very friable; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

B22t—60 to 80 inches; red (2.5YR 4/6) sandy loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid.

The solum is 80 inches to more than 120 inches thick. Reaction ranges from very strongly acid to strongly acid in all horizons except where the soil has been limed.

The A1 or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. It ranges from 3 to 9 inches in thickness. The A2 horizon has hue of 10YR, 7.5YR, or 5YR, value of 4 to 6, and chroma of 3 to 8; or it has hue of 2.5YR, value of 4 or 5, and chroma of 6 to 8. It ranges from 37 to 72 inches in thickness. Sand grains are generally coated. The total thickness of the A horizon ranges from 40 to 80 inches but is commonly 40 to 70 inches.

The B1 horizon, where present, has hue of 10YR or 7.5YR, value of 5, and chroma of 6; or it has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8. Texture is generally sandy loam. The B1 horizon ranges from 0 to 16 inches in thickness.

The B2t horizon has hue of 5YR, 7.5YR, or 2.5YR, values of 4 or 5, and chroma of 6 to 8; less commonly it has hue of 10YR, value of 5, and chroma of 6 to 8. A few pedons have mottles in shades of red and brown in the lower part of the B2t horizon. Texture is sandy loam or sandy clay loam.

Wahee series

Soils of the Wahee series are clayey, mixed, thermic Aeric Ochraquults. These soils are nearly level and somewhat poorly drained. They formed in clayey sediments of fluvial origin. These soils are on flood plains along stream terraces. Slopes range from 0 to 2 percent.

Wahee soils are near Chewacla, Riverview, Kalmia, and Maxton soils. Chewacla soils have a coarser textured subsoil. Riverview soils are at the highest elevation of the flood plain and are well drained. Kalmia and Maxton soils are on low terraces of larger streams, are better drained, and have a coarser textured subsoil.

Wahee soils are mapped only in association with Chewacla and Riverview soils.

Typical pedon of Wahee loam in a wooded area of Chewacla-Wahee-Riverview association, approximately 5 miles west of Jay and 100 yards south of State Highway 4, SE1/4SE1/4 sec. 10, T. 5 N., R. 30 W.:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) loam; few medium distinct very pale brown (10YR 7/3) and a few fine faint brown mottles; weak fine granular structure; friable; many fine and medium roots; few mica flakes; strongly acid; clear smooth boundary.

A2—3 to 8 inches; brown (10YR 5/3) loam; common medium distinct gray (10YR 6/1) and few fine prominent yellowish red (5YR 5/8) mottles, strong brown (7.5YR 5/6) mottles along root channels; weak medium subangular blocky structure; friable; many fine and common medium roots; few mica flakes; strongly acid; gradual smooth boundary.

B21t—8 to 14 inches; pale brown (10YR 6/3) clay; common medium distinct gray (10YR 6/1) and brown (10YR 4/3) and few fine prominent yellowish red (5YR 4/8) mottles; strong brown (7.5YR 5/6) mottles along root channels; moderate medium subangular blocky structure; firm, sticky and plastic; common fine and medium roots; few mica flakes; strongly acid; gradual smooth boundary.

B22tg—14 to 23 inches; light brownish gray (10YR 6/2) clay loam; common medium distinct yellowish brown (10YR 5/4, 5/6) and brown (10YR 4/3) and few fine prominent yellowish red (5YR 4/6) mottles; moderate fine subangular blocky structure; firm, sticky and plastic; few fine and medium roots; common fine mica flakes; strongly acid; gradual smooth boundary.

B23tg—23 to 40 inches; light brownish gray (10YR 6/2) clay loam; common medium distinct yellowish brown (10YR 5/4, 5/6) and brown (10YR 4/3) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; common fine mica flakes; strongly acid; gradual smooth boundary.

B24tg—40 to 65 inches; gray (10YR 6/1) clay; common medium distinct brown (10YR 4/3), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/6) and common fine distinct brown (10YR 5/3) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; common fine mica flakes; strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid in all horizons. Content of mica flakes ranges from few to common.

The A1 horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2 or hue of 2.5Y, value of 4 or 5, and chroma of 2. It ranges from 2 to 5 inches in thickness. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4 or hue of 2.5Y, value of 5, and chroma of 2. It ranges from 3 to 7 inches in thickness. The A2 horizon is loam, fine sandy loam, or silt loam.

The B1 horizon, where present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. It has few to common mottles in shades of brown, yellow, red, and gray. It is less than 10 inches thick. Texture is sandy clay loam or clay loam.

The B2t horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2 and few to common mottles in shades of gray, yellow, red, and brown. Where there is no B1 horizon, the upper 4 to 10 inches of the Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 8 and mottles in shades of gray, yellow, brown, or red. The B2t

horizon is clay, silty clay, silty clay loam, or clay loam. The upper 20 inches of the B2t horizon is more than 35 percent clay.

Formation of the soils

In this section the factors of soil formation are discussed and related to the soils in the survey area. In addition, the processes of soil formation are described.

Factors of soil formation

Soil is produced by forces of weathering and soil formation acting on parent material. The kind of soil that develops depends on five major factors. These factors are the climate under which soil material exists after accumulation, the plant and animal life in and on the soil, the type of parent material, the relief of the land, and the length of time that the forces of soil formation act on the soil material.

The five soil forming factors are interdependent: each modifies the effect of the others. Any of the five factors can have more influence than the others on the formation of a soil and can account for most of its properties. For example, if the parent material is quartz sand, the soil generally has only weakly expressed horizons. The effect of the parent material is modified greatly in some places by the effects of climate, relief, and plants and animals. A difference in any of the factors results in a different soil.

Parent material

Parent material is the unconsolidated mass in which a soil forms. It determines the limits of the chemical and mineralogical characteristics of soils and their physical constitution. Many differences among soils in the survey area appear to reflect original differences in the parent material.

The soils of Santa Rosa County have four major kinds of parent material. The sandy, loamy, and clayey deposits of the uplands and flatwoods are sea-laid sediments of Pleistocene age. The sandhills, which are mostly on Eglin Air Force Base, were deposited by wind. Other relatively new soils are still forming in the water-deposited material along streams and rivers. Where a considerable quantity of plant material accumulates and decay is limited by too much water, organic matter (muck) gradually develops. Deposits of muck are not restricted to any certain area.

Climate

The climate of Santa Rosa County is warm and humid and was similar during most of the period of soil formation. Summer is long and warm, and winter is short and mild. The climate is uniform throughout the county and therefore causes few differences among soils. Rainfall and temperature are the major factors of climate that influence soil formation.

Because of the warm temperatures and abundant rainfall, chemical and biological actions are rapid. These conditions are favorable for the rapid decomposition of organic matter and hasten chemical reactions in the soil. The large amount of rainfall leaches soluble bases, plant nutrients, and colloidal material downward. Consequently, most of the soils in this climate have little organic matter, low natural fertility, and high acidity.

Plants and animals

Both plants and animals have an important role in the formation of soils. The kinds and numbers of plants and animals that live in and on the soil are governed largely by climate and to lesser and varying degrees by each of the other soil forming factors.

Plants and animals furnish organic matter to soil, mix and stir the soil, and move plant nutrients to different horizons in the soil. Living organisms also help change structure and porosity of the soil.

Micro-organisms, including bacteria and fungi, help weather and break down minerals and decompose organic matter. They are most numerous in the upper few inches of the soil. Earthworms and other small animals that live in the soil alter the chemical composition and mix the different layers of the soil. Plants also act on the soil chemically and churn it by root penetration.

Relief

Relief, or topography, modifies the soil by influencing the quantity of precipitation absorbed and retained in the soil, thus affecting moisture relations; by influencing the rate that erosion removes soil material; and by directing movement of materials in suspension or solution from one area to another.

Poorly drained or very poorly drained soils generally are in low, nearly level areas and in depressions. Water is received as runoff from adjacent higher areas. The absence of air in these waterlogged soils results in the reduction of iron in the soil, so colors are dominantly gray. In Santa Rosa County these soils occur mainly along drainageways, in large swamps, and in the flatwoods.

The well drained upland soils are on nearly level to sloping ridges and side slopes where excess water readily drains away. As the slope increases, runoff increases in intensity, and erosion accelerates. These soils are well aerated and are dominantly yellow, brown, or red.

Where relief and position are intermediate, moderately well drained and somewhat poorly drained soils are dominant. They are brown or yellow but have gray mottles in the subsoil. The gray mottles indicate a fluctuating water table.

Time

The length of time required for a soil to form depends mainly on the combined influences of the other soil forming factors. If soil forming factors have been active for a long time, horizonation is stronger than if the same factors have been active for a relatively short time. Some basic minerals from which soils weather fairly rapidly; other minerals are chemically inert and show little change over long periods. The rate of movement of fine particles within the soil to form various horizons varies under different conditions. In geologic terms, relatively little time has elapsed since the material in which the soils developed was laid down or emerged from the sea.

In Santa Rosa County the dominant geological materials are inactive. The sands are almost pure quartz and are highly resistant to weathering. The finer textured silts and clays are the product of earlier weathering.

Processes of soil formation

The main 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 singly, depending on the integration of the factors of soil formation.

Most soils have three main horizons: A, B, and C.

The A horizon is the surface layer. In some soils it can be divided into an A1 horizon and an A2 horizon. The A1 part is the horizon of maximum accumulation of organic matter. The A2 part, usually called the subsurface layer, is the horizon of maximum loss of soluble or suspended material. Leon soils have both an A1 horizon and an A2 horizon. Some soils do not have an A2 horizon. Organic matter has accumulated in the surface layer of all soils in the county to form an A1 horizon. The content of organic matter varies in different soils and ranges from very low to high because of differences in relief and wetness.

The B horizon lies immediately below the A horizon and is often called the subsoil. It is the horizon of maximum accumulation of dissolved or suspended materials such as organic matter, iron, or clay. In very young, sandy soils, such as Lakeland soils, the B horizon has not yet developed.

The C horizon is the substratum. It has been affected very little by the soil forming processes, but it may be somewhat modified by weathering.

The chemical reduction and transfer of iron, called gleying, is evident in the wet soils of the county. Gleying, shown by gray color in the subsoil and gray mottles in other horizons, indicates the reduction and loss of iron. In some sandy soils the clean sand grains are gray and the color has no relation to gleying. Some horizons have reddish-brown mottles and concretions, indicating a segregation of iron as in the Tifton soils.

Leaching of carbonates and bases has occurred in all of the productive soils of the county. This contributes to the development of the horizons and to the inherent poor fertility of these soils.

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Glossary

Absorption field. The area into which a subsurface system of tile or perforated pipe distributes effluent from a septic tank into soil.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as

granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

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

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

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.

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

Badland. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

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.

Beds (Bedding). A partial method of controlling excess water for the growth of citrus and other crops using regularly spaced shallow ditches and beds.

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

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

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.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a fragment.

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

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

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

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.

Compressible (in tables). Excessive decrease in volume of soft soil 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.

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

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deep to water. Deep to permanent water table during dry season.

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

Depth to rock. 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 for 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.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

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

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

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

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

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

Excess humus. Too much organic matter for intended use.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excessive permeability. The rapid movement of water through the soil at rates adversely affecting the specified use.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Fast intake (in tables). The rapid movement of water into the soil.

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

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

Flatwoods. Broad, nearly level, low ridges of poorly drained, mainly sandy soils with a characteristic vegetation of open forest of pines and a ground cover of sawpalmetto and pineland threeawn.

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

Fluvial soil material. Earthy parent material accumulated through the action of a river.

Fragment. A part broken off or detached from the underlying limestone. As used here, they range from 2 millimeters to 25 centimeters in diameter or 2 millimeters to 38 centimeters in length if pieces are thin and flat.

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.

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.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

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

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

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

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

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

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

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

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

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.

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.

Landshaping. Rearrangement of soil material by cutting and filling to form a more suitable site for the intended use.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

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

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

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

Miscellaneous areas. Areas that have little or no natural soil and support little or no vegetation.

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).

Mounding. Filling the area for the absorption field with suitable soil material to the level above the water table necessary to meet local and State requirements.

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.

No water. Too deep to ground water.

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

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

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

Percs rapidly. See *Excessive permeability.*

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

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

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

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

Pitting (in tables). Pits caused by melting ground ice. They form on the soil after plant cover is removed.

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.

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 outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

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.

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.

Sealing or lining. Placing impervious material along the bottom and sides of excavations and trenches to prevent the downward and lateral movement of water.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

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.

Shoring. Constructing walls along sides of trenches to prevent soil from caving.

Slough. A broad, usually grassy, slightly depressed, poorly defined drainageway.

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.

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 blowing. Movement and deposition of soil material by wind.

Soil separates. Mineral particles less than 2 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	Less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Steephead. A nearly vertical, semicircular wall at the base of which springs emerge.

Stone line. A concentration of coarse fragments in a soil. Generally it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

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).

Subsidence. Settlement of the soil surface.

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

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

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

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt, silt loam, 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 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.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Water control. Regulate the water table according to the need of the intended use by canals, ditches, subsurface drains, pumping, or any other appropriate method.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wetness. Soil wet during period of use.

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*

Month	Temperature						Precipitation				
	Average daily high	Average daily low	Average daily	Average number of days with temperature of--		Average number of growing degree days	Average	2 years in 10 will have--		Average number of days with--	
				90°F or more	32°F or less			Less than--	More than--	0.10 inch or more	0.50 inch or more
	°F	°F	°F				In	In	In		
January	65.2	42.8	54.0	0	8	22	3.85	1.74	5.96	7	3
February	67.0	44.7	55.9	0	5	31	4.16	2.17	6.47	6	3
March	70.7	47.5	59.1	0	2	60	5.81	3.24	7.90	7	3
April	77.6	55.0	66.3	***	0	120	6.43	2.01	9.34	5	3
May	85.5	62.5	74.1	7	0	282	3.81	2.53	5.28	6	3
June	90.0	67.7	78.9	18	0	417	6.99	2.33	11.99	10	5
July	90.8	70.1	80.5	23	0	481	8.52	4.14	9.33	10	4
August	91.8	69.6	80.7	24	0	488	4.91	2.99	7.55	8	4
September	87.2	66.0	76.6	13	0	348	8.40	2.60	16.36	8	5
October	80.1	55.5	67.8	2	***	130	3.02	.71	5.08	5	2
November	70.3	44.8	57.6	0	3	30	3.57	1.20	6.95	5	2
December	64.6	41.5	53.1	0	8	18	5.30	3.05	7.77	6	3
Year	78.4	55.6	67.1	87	26	2,427	64.77	49.81	80.72	83	40

* Data from U.S. Department of Commerce (10).
** Growing degree days 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 (65° 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.
*** Less than 0.5.

TABLE 2.--FREEZE DATES IN SPRING AND FALL*

Freeze threshold temperature	Average date of last occurrence in spring	Average date of first occurrence in fall	Average number of days between dates	Number of occurrences in spring**	Number of occurrences in fall**
°F					
32	Feb. 18	Dec. 15	300	28	19
28	Jan. 21	Dec. 21	334	18	13
24	Jan. 15	Dec. 27	346	14	6

* Data from U.S. Department of Commerce (11).
** Number of occurrences in 30 years of record.

TABLE 3.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1	Albany loamy sand, 0 to 5 percent slopes	5,872	0.9
2	Angie Variant loam	1,775	0.3
3	Bibb-Kinston association	48,390	7.4
4	Bohicket and Handsboro soils	8,500	1.3
5	Bonifay loamy sand, 0 to 5 percent slopes	26,613	4.0
6	Chewacla-Wahee-Riverview association	25,160	3.8
7	Dorovan-Pamlico association	18,561	2.8
8	Dothan fine sandy loam, 0 to 2 percent slopes	13,670	2.1
9	Dothan fine sandy loam, 2 to 5 percent slopes	47,144	7.2
10	Dothan fine sandy loam, 5 to 8 percent slopes	9,759	1.5
11	Escambia fine sandy loam, 0 to 2 percent slopes	2,586	0.4
12	Esto loam, 2 to 5 percent slopes	1,680	0.3
13	Esto loam, 5 to 8 percent slopes	787	0.1
14	Fuquay loamy sand, 0 to 5 percent slopes	19,862	3.0
15	Fuquay loamy sand, 5 to 8 percent slopes	4,414	0.7
16	Garcon loamy fine sand	3,900	0.6
17	Gullied land	1,277	0.2
18	Johns fine sandy loam	6,363	1.0
19	Kalmia loamy fine sand, 2 to 5 percent slopes	1,577	0.2
20	Kureb sand, 0 to 8 percent slopes	3,421	0.5
21	Lakeland sand, 0 to 5 percent slopes	99,542	15.2
22	Lakeland sand, 5 to 12 percent slopes	8,662	1.3
23	Lakeland sand, 12 to 30 percent slopes	1,583	0.2
24	Leon sand, 0 to 2 percent slopes	5,778	0.9
25	Lucy loamy sand, 0 to 5 percent slopes	23,635	3.6
26	Lucy loamy sand, 5 to 8 percent slopes	519	0.1
27	Lynchburg fine sandy loam	4,226	0.6
28	Maxton loamy fine sand, 2 to 5 percent slopes	419	0.1
29	Mulat loamy fine sand	6,100	0.9
30	Orangeburg sandy loam, 0 to 2 percent slopes	11,688	1.8
31	Orangeburg sandy loam, 2 to 5 percent slopes	8,549	1.3
32	Orangeburg sandy loam, 5 to 8 percent slopes	1,179	0.2
33	Ortega sand, 0 to 5 percent slopes	5,341	0.8
34	Pactolus loamy sand, 0 to 5 percent slopes	27,958	4.2
35	Pickney loamy sand	3,793	0.6
36	Pits	846	0.1
37	Rains fine sandy loam	3,712	0.6
38	Red Bay sandy loam, 0 to 2 percent slopes	17,589	2.7
39	Red Bay sandy loam, 2 to 5 percent slopes	1,042	0.2
40	Rutlege loamy sand	13,784	2.1
41	Tifton sandy loam, 0 to 2 percent slopes	623	0.1
42	Tifton sandy loam, 2 to 5 percent slopes	3,002	0.5
43	Tifton sandy loam, 5 to 8 percent slopes	533	0.1
44	Troup loamy sand, 0 to 5 percent slopes	109,597	16.7
45	Troup loamy sand, 5 to 8 percent slopes	11,260	1.7
46	Troup loamy sand, 8 to 12 percent slopes	6,341	1.0
47	Troup-Orangeburg-Cowarts complex, 5 to 12 percent slopes	24,940	3.8
48	Urban land	558	0.1
	Water	1,250	0.2
	Total	655,360	100.0

TABLE 4.--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]

Soil name and map symbol	Cotton lint	Corn	Wheat	Peanuts	Soybeans	Bahiagrass	Improved bermudagrass
	Lb	Bu	Bu	Lb	Bu	AUM*	AUM*
1---------- Albany	---	75	20	1,700	20	6.5	7.0
2---------- Angie Variant	450	60	25	---	---	6.5	8.0
3**:							
Bibb----------	---	55	---	---	20	7.0	---
Kinston----------	---	50	---	---	20	6.5	---
4---------- Bohicket and Handsboro	---	---	---	---	---	---	---
5---------- Bonifay	400	50	20	1,600	20	65	7.0
6**:							
Chewacla----------	---	---	---	---	---	---	---
Wahee----------	---	---	---	---	---	---	---
Riverview----------	---	---	---	---	---	---	---
7**:							
Dorovan----------	---	---	---	---	---	---	---
Pamlico----------	---	---	---	---	---	---	---
8---------- Dothan	900	120	35	3,800	40	9	10.0
9---------- Dothan	900	120	35	3,600	35	9	10.0
10---------- Dothan	800	100	30	3,600	30	8	9.0
11---------- Escambia	---	100	30	---	40	8.0	9.0
12---------- Esto	500	50	25	2,500	35	6.0	6.0
13---------- Esto	450	40	25	2,500	30	5.8	5.8
14---------- Fuquay	650	80	35	2,900	30	6.0	7.5
15---------- Fuquay	600	75	30	2,600	25	6.0	7.5
16---------- Garcon	---	60	---	---	---	6.5	6.0
17**. Gullied land							
18---------- Johns	650	120	30	2,500	35	6.5	6.0

See footnotes at end of table.

TABLE 4.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Cotton lint	Corn	Wheat	Peanuts	Soybeans	Bahiagrass	Improved bermuda-grass
	Lb	Bu	Bu	Lb	Bu	AUM*	AUM*
19--- Kalmia	700	100	30	2,700	40	9.0	10.0
20--- Kureb	---	---	---	---	---	4.0	3.5
21--- Lakeland	300	55	20	2,000	20	7.0	7.0
22--- Lakeland	---	---	---	---	---	6.5	6.5
23--- Lakeland	---	---	---	---	---	6.0	6.0
24--- Leon	---	50	20	---	---	7.0	---
25--- Lucy	650	80	35	3,000	33	8.5	8.0
26--- Lucy	600	70	35	2,500	25	8.5	7.5
27--- Lynchburg	600	115	30	---	35	9.0	---
28--- Maxton	700	100	35	3,000	40	8.5	9.0
29--- Mulat	---	---	---	---	---	8.5	---
30--- Orangeburg	900	100	40	4,000	50	8.5	10.5
31--- Orangeburg	850	100	40	3,800	45	8.5	10.5
32--- Orangeburg	800	90	35	3,200	35	8.0	10.0
33--- Ortega	---	45	20	2,000	20	6.0	---
34--- Pactolus	---	65	25	2,000	25	8.0	8.5
35--- Pickney	---	---	---	---	---	---	---
36**. Pits							
37--- Rains	---	75	30	1,700	20	8.0	---
38--- Red Bay	750	90	80	3,500	40	10	10
39--- Red Bay	750	90	75	3,200	40	9.5	9.5
40--- Rutlege	---	75	30	1,700	20	8.0	---
41--- Tifton	950	100	40	4,000	46	8.5	10.5

See footnotes at end of table.

TABLE 4.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Cotton lint	Corn	Wheat	Peanuts	Soybeans	Bahiagrass	Improved bermuda-grass
	Lb	Bu	Bu	Lb	Bu	AUM*	AUM*
42---------- Tifton	950	100	40	3,800	46	8.5	10.5
43---------- Tifton	750	85	35	3,500	38	8.0	10.0
44---------- Troup	650	85	35	3,000	30	7.2	7.5
45---------- Troup	650	85	35	3,000	30	7.0	7.3
46---------- Troup	---	---	---	---	---	5.0	6.5
47---------- Troup-Orangeburg-Cowarts	---	---	---	---	---	7.0	7.3
48**. Urban land							

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 5.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	43,570	---	---	---	---
II	129,112	61,733	23,882	43,497	---
III	208,371	19,023	14,906	174,442	---
IV	129,885	787	18,296	110,802	---
V	48,390	---	48,390	---	---
VI	60,941	---	17,577	43,364	---
VII	20,144	---	18,561	1,583	---
VIII	8,500	---	8,500	---	---

TABLE 6.--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. Site index was calculated at 30 years for eastern cottonwood, 35 years for American sycamore, and 50 years for all other species]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
1---------- Albany	3w	Slight	Moderate	Moderate	Slight	Loblolly pine------- Slash pine---------- Longleaf pine-------	80 80 65	Loblolly pine, slash pine.
2---------- Angie Variant	2w	Slight	Moderate	Slight	Slight	Slash pine---------- Sweetgum---------- Loblolly pine------- Longleaf pine-------	90 90 90 80	Slash pine, loblolly pine.
3*: Bibb----------	2w	Slight	Severe	Severe	Moderate	Loblolly pine------- Sweetgum---------- Water oak----------	90 90 90	Eastern cottonwood, loblolly pine, sweetgum, American sycamore.
Kinston----------	1w	Slight	Severe	Severe	Slight	Loblolly pine------- Sweetgum---------- Eastern cottonwood-- Cherrybark oak------	100 95 100 95	Loblolly pine, slash pine, American sycamore, eastern cottonwood, sweetgum.
5---------- Bonifay	3s	Slight	Moderate	Moderate	Slight	Slash pine---------- Longleaf pine------- Loblolly pine-------	80 65 80	Slash pine, loblolly pine.
6*: Chewacla----------	1w	Slight	Moderate	Moderate	Slight	Loblolly pine------- Yellow-poplar------- American sycamore--- Sweetgum---------- Water oak---------- Eastern cottonwood-- Southern red oak----	96 104 90 97 86 100 90	Loblolly pine, slash pine, American sycamore, sweetgum.
Wahee----------	2w	Slight	Moderate	Moderate	Slight	Loblolly pine------- Slash pine---------- Sweetgum---------- Longleaf pine-------	90 90 90 75	Loblolly pine, slash pine, sweetgum, American sycamore.
Riverview---------	1o	Slight	Moderate	Moderate	Slight	Slash pine---------- Loblolly pine------- Sweetgum----------	100 100 100	Loblolly pine, slash pine, eastern cottonwood, sweetgum, American sycamore.
7*: Dorovan----------	---	Slight	Severe	Severe	Severe	Blackgum---------- Sweetbay----------	--- ---	
Pamlico----------	---	Slight	Severe	Severe	Severe	Pond pine---------- Baldcypress--------- Water tupelo--------	--- --- ---	
8, 9, 10---------- Dothan	2o	Slight	Slight	Slight	Slight	Slash pine---------- Longleaf pine------- Loblolly pine-------	90 75 90	Slash pine, loblolly pine.

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
11---------- Escambia	2w	Slight	Moderate	Slight	Moderate	Loblolly pine------- Longleaf pine------- Slash pine---------- Sweetgum----------	90 75 90 90	Loblolly pine, slash pine, American sycamore, sweetgum.
12, 13---------- Esto	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Longleaf pine------- Slash pine----------	80 65 80	Loblolly pine, slash pine.
14, 15---------- Fuquay	3s	Slight	Moderate	Moderate	Slight	Loblolly pine------- Slash pine---------- Longleaf pine-------	80 80 65	Slash pine, longleaf pine.
16---------- Garcon	3w	Slight	Slight	Moderate	Slight	Slash pine---------- Longleaf pine-------	80 65	Slash pine.
18---------- Johns	2w	Slight	Moderate	Slight	Slight	Loblolly pine------- Sweetgum---------- Slash pine----------	90 90 90	Loblolly pine, slash pine.
19---------- Kalmia	2o	Slight	Slight	Slight	Slight	Loblolly pine------- Slash pine---------- Sweetgum----------	90 90 85	Loblolly pine, slash pine.
20---------- Kureb	5s	Slight	Severe	Severe	Slight	Longleaf pine------- Sand pine----------	50 60	Longleaf pine, sand pine.
21, 22, 23--------- Lakeland	3s	Slight	Moderate	Moderate	Slight	Slash pine---------- Loblolly pine------- Longleaf pine-------	80 80 65	Slash pine, loblolly pine.
25, 26---------- Lucy	3s	Slight	Moderate	Moderate	Slight	Slash pine---------- Longleaf pine------- Loblolly pine-------	80 65 80	Slash pine, longleaf pine, loblolly pine.
27---------- Lynchburg	2w	Slight	Moderate	Slight	Slight	Slash pine---------- Loblolly pine------- Longleaf pine------- Sweetgum----------	90 90 75 90	Slash pine, loblolly pine, American sycamore, sweetgum.
28---------- Maxton	2o	Slight	Slight	Slight	Slight	Loblolly pine------- Sweetgum---------- Slash pine----------	90 90 80	Loblolly pine, slash pine, cherrybark oak.
29---------- Mulat	---	Slight	Severe	Severe	---------	Baldcypress---------	---	
30, 31, 32--------- Orangeburg	2o	Slight	Slight	Slight	Slight	Loblolly pine------- Slash pine---------- Longleaf pine-------	90 90 75	Slash pine, loblolly pine.
33---------- Ortega	3s	Slight	Moderate	Moderate	Slight	Slash pine---------- Longleaf pine------- Loblolly pine-------	80 65 80	Slash pine, loblolly pine.
34---------- Pactolus	3w	Slight	Moderate	Moderate	Slight	Loblolly pine------- Longleaf pine------- Slash pine----------	80 65 80	Loblolly pine, slash pine.
35---------- Pickney	1w	Slight	Severe	Severe	Moderate	Sweetgum---------- Loblolly pine------- Eastern cottonwood--	95 100 100	Sweetgum, loblolly pine, slash pine, American sycamore.
37---------- Rains	2w	Slight	Severe	Severe	Slight	Loblolly pine------- Slash pine---------- Sweetgum----------	90 90 90	Loblolly pine, slash pine, sweetgum, American sycamore.

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
38, 39---------- Red Bay	2o	Slight	Slight	Slight	Slight	Loblolly pine-------	90	Loblolly pine, slash pine.
						Slash pine----------	90	
						Longleaf pine-------	75	
40---------- Rutlege	2w	Slight	Severe	Severe	Slight	Loblolly pine-------	90	Loblolly pine, slash pine.
						Sweetgum----------	90	
						Slash pine----------	90	
41, 42, 43--------- Tifton	2o	Slight	Slight	Slight	Slight	Loblolly pine-------	90	Loblolly pine, slash pine.
						Slash pine----------	90	
						Longleaf pine-------	75	
44, 45, 46--------- Troup	3s	Slight	Moderate	Moderate	Slight	Loblolly pine-------	80	Loblolly pine, longleaf pine, slash pine.
						Longleaf pine-------	65	
						Slash pine----------	80	
47*:								
Troup----------	3s	Slight	Moderate	Moderate	Slight	Loblolly pine-------	80	Loblolly pine, longleaf pine, slash pine.
						Longleaf pine-------	65	
						Slash pine----------	80	
Orangeburg--------	2o	Slight	Slight	Slight	Slight	Loblolly pine-------	90	Slash pine, loblolly pine.
						Slash pine----------	90	
						Longleaf pine-------	75	
Cowarts----------	2o	Slight	Slight	Slight	Slight	Loblolly pine-------	90	Loblolly pine, slash pine.
						Slash pine----------	90	
						Longleaf pine-------	75	

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
1 Albany	Moderate: wetness.	Moderate: wetness, too sandy.	Moderate: wetness.	Moderate: too sandy, wetness.
2 Angie Variant	Severe: floods, percs slowly.	Slight	Severe: percs slowly.	Slight.
3*: Bibb	Severe: floods, wetness.	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.
Kinston	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
4*: Bohicket	Severe: floods, too clayey, wetness.	Severe: floods, too clayey, wetness.	Severe: floods, too clayey, wetness.	Severe: floods, too clayey, wetness.
Handsboro	Severe: floods, excess humus, wetness.	Severe: floods, excess humus, wetness.	Severe: floods, wetness, excess humus.	Severe: floods, wetness, excess humus.
5 Bonifay	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.
6*: Chewacla	Severe: floods, wetness.	Moderate: wetness, floods.	Severe: wetness, floods.	Moderate: wetness, floods.
Wahee	Severe: floods, wetness.	Severe: wetness.	Severe: wetness, floods.	Moderate: wetness, floods.
Riverview	Moderate: floods.	Moderate: floods.	Moderate: floods.	Slight.
7*: Dorovan	Severe: floods, wetness.	Severe: wetness, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, excess humus.
Pamlico	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
8 Dothan	Slight	Slight	Slight	Slight.
9 Dothan	Slight	Slight	Moderate: slope.	Slight.
10 Dothan	Slight	Slight	Severe: slope.	Slight.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
11--Escambia	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness, percs slowly.	Slight.
12--Esto	Moderate: percs slowly.	Slight	Moderate: percs slowly, slope.	Slight.
13--Esto	Moderate: percs slowly.	Slight	Severe: slope.	Slight.
14--Fuquay	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.
15--Fuquay	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.
16--Garcon	Moderate: too sandy, wetness.	Moderate: too sandy, wetness.	Moderate: too sandy, wetness.	Moderate: too sandy, wetness.
17*. Gullied land				
18--Johns	Moderate: floods, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
19--Kalmia	Slight	Slight	Moderate: slope.	Slight.
20--Kureb	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
21--Lakeland	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
22--Lakeland	Severe: too sandy.	Severe: too sandy.	Severe: too sandy, slope.	Severe: too sandy.
23--Lakeland	Severe: too sandy, slope.	Severe: too sandy, slope.	Severe: too sandy, slope.	Severe: too sandy.
24--Leon	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.
25--Lucy	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.
26--Lucy	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.
27--Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.
28--Maxton	Severe: floods.	Slight	Moderate: slope.	Slight.
29--Mulat	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
30--Orangeburg	Slight	Slight	Slight	Slight.
31--Orangeburg	Slight	Slight	Moderate: slope.	Slight.
32--Orangeburg	Slight	Slight	Severe: slope.	Slight.
33--Ortega	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
34--Pactolus	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: too sandy.
35--Pickney	Severe: floods, too sandy, wetness.	Severe: floods, too sandy, wetness.	Severe: floods, too sandy, wetness.	Severe: floods, too sandy, wetness.
36*. Pits				
37--Rains	Severe: wetness, floods.	Severe: wetness.	Severe: wetness.	Severe: wetness.
38--Red Bay	Slight	Slight	Slight	Slight.
39--Red Bay	Slight	Slight	Moderate: slope.	Slight.
40--Rutlege	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.
41--Tifton	Slight	Slight	Moderate: small stones.	Slight.
42--Tifton	Slight	Slight	Moderate: slope, small stones.	Slight.
43--Tifton	Slight	Slight	Severe: slope.	Slight.
44--Troup	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.
45--Troup	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.
46--Troup	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.
47*:				
Troup	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.
Orangeburg	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
47*: Cowarts	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
48*. Urban land				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							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
1---------- Albany	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Poor.
2---------- Angie Variant	Good	Good	Good	Fair	Good	Poor	Poor	Good	Good	Poor.
3*:										
Bibb----------	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Kinston----------	Very poor.	Poor	Poor	Poor	Poor	Good	Fair	Poor	Poor	Fair.
4*:										
Bohicket----------	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Poor	Very poor.	Very poor.	Poor.
Handsboro---------	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Poor.
5---------- Bonifay	Poor	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Fair	Very poor.
6*:										
Chewacla----------	Very poor.	Poor	Poor	Good	Good	Fair	Fair	Poor	Good	Fair.
Wahee----------	Very poor.	Poor	Fair	Good	Good	Fair	Fair	Poor	Good	Fair.
Riverview---------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
7*:										
Dorovan----------	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Pamlico----------	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
8, 9, 10---------- Dothan	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
11---------- Escambia	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
12---------- Esto	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
13---------- Esto	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
14---------- Fuquay	Fair	Fair	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
15---------- Fuquay	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
16---------- Garcon	Poor	Fair	Good	Poor	Fair	Poor	Poor	Fair	Fair	Poor.
17*. Gullied land										

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	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
18--Johns	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
19--Kalmia	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
20--Kureb	Very poor.	Poor	Poor	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.
21, 22, 23--Lakeland	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
24--Leon	Poor	Fair	Good	Poor	Fair	Fair	Poor	Fair	Fair	Poor.
25, 26--Lucy	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
27--Lynchburg	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
28--Maxton	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
29--Mulat	Poor	Poor	Fair	Poor	Poor	Fair	Good	Poor	Poor	Fair.
30, 31--Orangeburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
32--Orangeburg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
33--Ortega	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
34--Pactolus	Fair	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
35--Pickney	Very poor.	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
36*. Pits										
37--Rains	Very poor.	Very poor.	Very poor.	Fair	Fair	Good	Good	Very poor.	Poor	Good.
38--Red Bay	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
39--Red Bay	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
40--Rutlege	Very poor.	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair.
41--Tifton	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
42--Tifton	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
43--Tifton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	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
44, 45, 46---------- Troup	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
47*:										
Troup----------	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Orangeburg--------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Cowarts----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
48*. Urban land										

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--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]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
1 Albany	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.
2 Angie Variant	Severe: too clayey.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: low strength, shrink-swell.
3*: Bibb	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
Kinston	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
4*: Bohicket	Severe: floods, too clayey, wetness.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.
Handsboro	Severe: floods, excess humus, wetness.	Severe: floods, wetness, low strength.	Severe: floods, wetness, low strength.	Severe: floods, wetness, low strength.	Severe: floods, wetness, low strength.
5 Bonifay	Severe: cutbanks cave.	Slight	Slight	Slight	Slight.
6*: Chewacla	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
Wahee	Severe: floods, wetness, too clayey.	Severe: floods, wetness, low strength.	Severe: floods, wetness, low strength.	Severe: floods, wetness, low strength.	Severe: floods, wetness, low strength.
Riverview	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
7*: Dorovan	Severe: excess humus, wetness, floods.	Severe: wetness, floods, low strength.	Severe: wetness, floods, low strength.	Severe: wetness, floods, low strength.	Severe: wetness, floods, low strength.
Pamlico	Severe: floods, wetness.	Severe: wetness, floods, low strength.	Severe: wetness, floods, low strength.	Severe: wetness, floods, low strength.	Severe: wetness, floods, low strength.
8, 9 Dothan	Slight	Slight	Moderate: wetness.	Slight	Slight.
10 Dothan	Slight	Slight	Moderate: wetness.	Moderate: slope.	Slight.
11 Escambia	Severe: wetness.	Moderate: wetness, low strength.	Severe: wetness.	Moderate: wetness, low strength.	Moderate: wetness, low strength.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
12, 13---------- Esto	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Severe: low strength.
14---------- Fuquay	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
15---------- Fuquay	Slight----------	Slight----------	Slight----------	Moderate: slope.	Slight.
16---------- Garcon	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
17*. Gullied land					
18---------- Johns	Severe: wetness.	Severe: floods.	Severe: wetness, floods.	Severe: wetness, floods.	Moderate: wetness, floods.
19---------- Kalmia	Moderate: cutbanks cave.	Slight----------	Slight----------	Slight----------	Slight.
20---------- Kureb	Severe: cutbanks cave.	Slight----------	Slight----------	Moderate: slope.	Slight.
21---------- Lakeland	Severe: cutbanks cave.	Slight----------	Slight----------	Slight----------	Slight.
22---------- Lakeland	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
23---------- Lakeland	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
24---------- Leon	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
25---------- Lucy	Moderate: cutbanks cave.	Slight----------	Slight----------	Slight----------	Slight.
26---------- Lucy	Moderate: cutbanks cave.	Slight----------	Slight----------	Moderate: slope.	Slight.
27---------- Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, low strength.
28---------- Maxton	Moderate: cutbanks cave.	Severe: floods.	Severe: floods.	Severe: floods.	Slight.
29---------- Mulat	Severe: cutbanks cave, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness.
30, 31---------- Orangeburg	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
32---------- Orangeburg	Slight----------	Slight----------	Slight----------	Moderate: slope.	Slight.
33---------- Ortega	Severe: cutbanks cave.	Slight----------	Moderate: wetness.	Slight----------	Slight.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
34---------- Pactolus	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.
35---------- Pickney	Severe: cutbanks cave, floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
36*. Pits					
37---------- Rains	Severe: wetness.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, low strength.
38, 39---------- Red Bay	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
40---------- Rutlege	Severe: wetness, cutbanks cave, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
41, 42---------- Tifton	Slight----------	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Severe: low strength.
43---------- Tifton	Slight----------	Moderate: low strength.	Moderate: low strength.	Moderate: slope, low strength.	Severe: low strength.
44---------- Troup	Severe: cutbanks cave.	Slight----------	Slight----------	Slight----------	Slight.
45---------- Troup	Severe: cutbanks cave.	Slight----------	Slight----------	Moderate: slope.	Slight.
46---------- Troup	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
47*: Troup----------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Orangeburg-------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Cowarts----------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
48*. Urban land					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1 Albany	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Poor: wetness.
2 Angie Variant	Severe: percs slowly, wetness.	Severe: floods, wetness.	Severe: too clayey, wetness.	Moderate: wetness.	Poor: too clayey.
3*: Bibb	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
Kinston	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
4*: Bohicket	Severe: floods, percs slowly, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: too clayey, wetness.
Handsboro	Severe: wetness, floods.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: floods, wetness.	Poor: excess humus, wetness, floods.
5 Bonifay	Slight	Moderate: seepage.	Slight	Slight	Poor: too sandy, seepage.
6*: Chewacla	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Good.
Wahee	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness, too clayey.	Severe: floods, wetness.	Poor: wetness, thin layer.
Riverview	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage.	Severe: floods, seepage.	Fair: thin layer.
7*: Dorovan	Severe: floods, wetness.	Severe: floods, excess humus, wetness.	Severe: floods, seepage, wetness.	Severe: floods, wetness.	Poor: wetness, excess humus.
Pamlico	Severe: wetness, floods.	Severe: wetness, floods, excess humus.	Severe: wetness, floods.	Severe: wetness, floods.	Poor: wetness, excess humus, hard to pack.
8 Dothan	Severe: wetness, percs slowly.	Moderate: seepage.	Moderate: wetness.	Slight	Good.
9, 10 Dothan	Severe: wetness, percs slowly.	Moderate: slope, seepage.	Moderate: wetness.	Slight	Good.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
11---------- Escambia	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Good.
12, 13---------- Esto	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
14, 15---------- Fuquay	Moderate: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Good.
16---------- Garcon	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: too sandy.
17*. Gullied land					
18---------- Johns	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.	Severe: wetness.	Good.
19---------- Kalmia	Slight----------	Moderate: slope, seepage.	Slight----------	Slight----------	Good.
20---------- Kureb	Slight----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy.
21---------- Lakeland	Slight----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage.
22---------- Lakeland	Moderate: slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage.
23---------- Lakeland	Severe: slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage, slope.	Poor: too sandy, slope, seepage.
24---------- Leon	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
25, 26---------- Lucy	Slight----------	Severe: seepage.	Slight----------	Slight----------	Good.
27---------- Lynchburg	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness.	Poor: wetness.
28---------- Maxton	Moderate: floods.	Moderate: seepage.	Moderate: floods.	Moderate: floods.	Fair: thin layer.
29---------- Mulat	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
30---------- Orangeburg	Slight----------	Moderate: seepage.	Slight----------	Slight----------	Good.
31, 32---------- Orangeburg	Slight----------	Moderate: slope, seepage.	Slight----------	Slight----------	Good.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
33--Ortega	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: too sandy.
34--Pactolus	Severe: wetness.	Severe: wetness, seepage.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: too sandy.
35--Pickney	Severe: floods, wetness.	Severe: floods, seepage, wetness.	Severe: floods, seepage, wetness.	Severe: floods, seepage, wetness.	Poor: seepage, too sandy, wetness.
36*. Pits					
37--Rains	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.	Severe: wetness.	Poor: wetness.
38--Red Bay	Slight	Moderate: seepage.	Slight	Slight	Good.
39--Red Bay	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
40--Rutlege	Severe: wetness, floods.	Severe: seepage, wetness, floods.	Severe: wetness, seepage, floods.	Severe: wetness, seepage, floods.	Poor: too sandy, wetness.
41--Tifton	Moderate: percs slowly.	Moderate: seepage.	Slight	Slight	Good.
42, 43--Tifton	Moderate: percs slowly.	Moderate: slope, seepage.	Slight	Slight	Good.
44, 45--Troup	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Fair: too sandy.
46--Troup	Moderate: slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Fair: too sandy, slope.
47*: Troup	Moderate: slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Fair: too sandy, slope.
Orangeburg	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.	Fair: slope.
Cowarts	Severe: percs slowly.	Severe: slope.	Slight	Slight	Fair: thin layer, slope.
48*. Urban land					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1 Albany	Fair: wetness.	Poor: excess fines.	Unsuited: excess fines.	Fair: too sandy.
2 Angie Variant	Poor: low strength, shrink-swell.	Poor: excess fines.	Unsuited: excess fines.	Poor: thin layer.
3*:				
Bibb	Poor: wetness.	Poor: excess fines.	Unsuited: excess fines.	Poor: wetness.
Kinston	Poor: wetness.	Poor: excess fines.	Unsuited: excess fines.	Poor: wetness.
4*:				
Bohicket	Poor: shrink-swell, low strength, wetness.	Poor: excess fines.	Unsuited: excess fines.	Poor: wetness, too clayey.
Handsboro	Poor: excess humus, wetness, low strength.	Poor: excess fines, excess humus.	Unsuited: excess fines.	Poor: excess salt, wetness.
5 Bonifay	Good	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.
6*:				
Chewacla	Poor: wetness, low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
Wahee	Poor: low strength, wetness.	Poor: excess fines.	Unsuited: excess fines.	Poor: wetness.
Riverview	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
7*:				
Dorovan	Poor: low strength, wetness.	Poor: excess humus.	Unsuited: excess fines, excess humus.	Poor: excess humus, wetness.
Pamlico	Poor: wetness, excess humus.	Poor: excess humus.	Unsuited: excess humus.	Poor: wetness.
8, 9, 10 Dothan	Good	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
11 Escambia	Fair: wetness, low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
12, 13 Esto	Poor: low strength.	Poor: excess fines.	Unsuited: excess fines.	Poor: too clayey.
14, 15 Fuquay	Good	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.
16 Garcon	Fair: wetness.	Poor: excess fines.	Unsuited: excess fines.	Fair: too sandy.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
17*. Gullied land				
18---------- Johns	Fair: wetness.	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
19---------- Kalmia	Good----------	Poor: excess fines.	Unsuited: excess fines.	Fair: too sandy, thin layer.
20---------- Kureb	Good----------	Good----------	Unsuited: excess fines.	Poor: too sandy.
21, 22---------- Lakeland	Good----------	Good----------	Unsuited: excess fines.	Poor: too sandy.
23---------- Lakeland	Fair: slope.	Good----------	Unsuited: excess fines.	Poor: too sandy, slope.
24---------- Leon	Poor: wetness.	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy, wetness.
25, 26---------- Lucy	Fair: low strength.	Fair: excess fines, thin layer.	Unsuited: excess fines.	Fair: too sandy.
27---------- Lynchburg	Poor: wetness, low strength.	Poor: excess fines.	Unsuited: excess fines.	Poor: wetness.
28---------- Maxton	Good----------	Poor: excess fines.	Unsuited: excess fines.	Fair: too sandy, thin layer.
29---------- Mulat	Poor: wetness.	Poor: thin layer.	Unsuited: excess fines.	Poor: wetness.
30, 31, 32---------- Orangeburg	Good----------	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
33---------- Ortega	Good----------	Good----------	Unsuited: excess fines.	Poor: too sandy.
34---------- Pactolus	Fair: wetness.	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy.
35---------- Pickney	Poor: wetness.	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy, wetness.
36*. Pits				
37---------- Rains	Poor: wetness, low strength.	Poor: excess fines.	Unsuited: excess fines.	Poor: wetness.
38, 39---------- Red Bay	Good----------	Poor: excess fines.	Unsuited: excess fines.	Good.
40---------- Rutlege	Poor: wetness.	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy, wetness.
41, 42, 43---------- Tifton	Poor: low strength.	Poor: thin layer.	Unsuited: excess fines.	Poor: small stones.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
44, 45, 46---------- Troup	Good----------	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy.
47*: Troup----------	Good----------	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy.
Orangeburg----------	Good----------	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Cowarts----------	Fair: thin layer.	Poor: excess fines.	Unsuited: excess fines.	Fair: slope.
48*. Urban land				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--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]

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
1---------- Albany	Severe: seepage.	Moderate: seepage, wetness.	Moderate: slow refill.	Favorable------	Fast intake, wetness.	Wetness, too sandy, soil blowing.	Wetness.
2---------- Angie Variant	Slight---------	Moderate: hard to pack, wetness.	Severe: slow refill.	Percs slowly---	Percs slowly, wetness.	Not needed-----	Percs slowly.
3*: Bibb----------	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Floods---------	Floods, wetness.	Not needed-----	Wetness.
Kinston----------	Moderate: seepage.	Moderate: piping.	Slight---------	Poor outlets, floods.	Floods, wetness.	Not needed-----	Wetness.
4*: Bohicket---------	Slight---------	Severe: low strength, compressible, shrink-swell.	Severe: salty water.	Floods, percs slowly, wetness.	Not needed-----	Not needed-----	Wetness, excess salt.
Handsboro--------	Severe: seepage.	Severe: unstable fill, excess humus.	Severe: salty water.	Excess salt, cutbanks cave, floods.	Floods, excess salt.	Not needed-----	Wetness, excess salt.
5---------- Bonifay	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Not needed-----	Fast intake, slope, droughty.	Not needed-----	Droughty.
6*: Chewacla---------	Moderate: seepage.	Severe: hard to pack, piping, wetness.	Moderate: slow refill.	Poor outlets, floods.	Wetness, floods.	Not needed-----	Wetness.
Wahee----------	Slight---------	Severe: wetness.	Severe: slow refill.	Floods, percs slowly.	Percs slowly, wetness, slow intake.	Not needed-----	Wetness, percs slowly.
Riverview--------	Moderate: seepage.	Moderate: piping.	Severe: deep to water.	Not needed-----	Floods---------	Not needed-----	Favorable.
7*: Dorovan----------	Moderate: seepage.	Severe: excess humus, wetness.	Slight---------	Floods, excess humus.	Wetness--------	Not needed-----	Wetness.
Pamlico----------	Severe: seepage.	Severe: piping.	Slight---------	Floods, poor outlets.	Wetness, floods.	Not needed-----	Wetness.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
8---------- Dothan	Slight---------	Slight---------	Severe: slow refill.	Not needed-----	Favorable------	Not needed-----	Favorable.
9---------- Dothan	Slight---------	Slight---------	Severe: slow refill.	Not needed-----	Favorable------	Soil blowing---	Favorable.
10---------- Dothan	Slight---------	Slight---------	Severe: slow refill.	Not needed-----	Slope----------	Soil blowing---	Favorable.
11---------- Escambia	Moderate: seepage.	Moderate: thin layer, wetness.	Severe: slow refill.	Percs slowly, slope.	Wetness, slope.	Not needed-----	Favorable.
12, 13---------- Esto	Slight---------	Moderate: low strength.	Severe: no water.	Not needed-----	Slow intake, percs slowly.	Percs slowly---	Percs slowly.
14, 15---------- Fuquay	Slight---------	Moderate: piping.	Severe: deep to water.	Not needed-----	Fast intake----	Too sandy, soil blowing.	Favorable.
16---------- Garcon	Severe: seepage.	Severe: seepage, piping.	Moderate: deep to water.	Favorable------	Wetness, fast intake.	Not needed-----	Favorable.
17*. Gullied land							
18---------- Johns	Moderate: seepage.	Moderate: seepage.	Moderate: deep to water.	Cutbanks cave	Wetness--------	Not needed-----	Favorable.
19---------- Kalmia	Moderate: seepage.	Moderate: seepage.	Severe: deep to water.	Not needed-----	Droughty, fast intake, soil blowing.	Soil blowing---	Favorable.
20---------- Kureb	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Not needed-----	Fast intake, slope, droughty.	Too sandy, slope.	Droughty.
21, 22, 23-------- Lakeland	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Not needed-----	Droughty, seepage, fast intake.	Too sandy, soil blowing.	Droughty.
24---------- Leon	Severe: seepage.	Severe: seepage, piping, wetness.	Moderate: deep to water.	Cutbanks cave	Wetness, fast intake.	Not needed-----	Wetness.
25, 26---------- Lucy	Severe: seepage.	Moderate: thin layer.	Severe: no water.	Not needed-----	Fast intake----	Too sandy, slope, soil blowing.	Favorable.
27---------- Lynchburg	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Favorable------	Wetness, fast intake.	Not needed-----	Wetness.
28---------- Maxton	Moderate: seepage.	Moderate: seepage.	Severe: deep to water.	Not needed-----	Favorable------	Soil blowing---	Favorable.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
29---------- Mulat	Severe: seepage.	Severe: seepage, piping, wetness.	Slight---------	Favorable------	Wetness, fast intake.	Not needed-----	Wetness.
30---------- Orangeburg	Moderate: seepage.	Slight---------	Severe: no water.	Not needed-----	Favorable------	Not needed-----	Favorable.
31---------- Orangeburg	Moderate: seepage.	Slight---------	Severe: no water.	Not needed-----	Favorable------	Soil blowing---	Favorable.
32---------- Orangeburg	Moderate: seepage.	Slight---------	Severe: no water.	Not needed-----	Slope----------	Soil blowing---	Favorable.
33---------- Ortega	Severe: seepage.	Severe: seepage, piping.	Severe: deep to water.	Not needed-----	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
34---------- Pactolus	Severe: seepage.	Severe: seepage.	Moderate: deep to water.	Cutbanks cave	Wetness, fast intake.	Not needed-----	Droughty.
35---------- Pickney	Severe: seepage.	Severe: seepage, piping, unstable fill.	Slight---------	Cutbanks cave, floods, poor outlets.	Seepage, floods, wetness.	Not needed-----	Wetness.
36*. Pits							
37---------- Rains	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Favorable------	Wetness, fast intake.	Not needed-----	Wetness.
38, 39---------- Red Bay	Moderate: seepage.	Slight---------	Severe: no water.	Not needed-----	Slope----------	Soil blowing---	Favorable.
40---------- Rutlege	Seepage--------	Seepage, unstable fill, piping.	Favorable------	Cutbanks cave, wetness, floods.	Wetness, fast intake, droughty.	Not needed-----	Wetness.
41---------- Tifton	Moderate: seepage.	Slight---------	Severe: no water.	Not needed-----	Fast intake----	Not needed-----	Favorable.
42---------- Tifton	Moderate: seepage.	Slight---------	Severe: no water.	Not needed-----	Fast intake----	Slope, too sandy, soil blowing.	Favorable.
43---------- Tifton	Moderate: seepage.	Slight---------	Severe: no water.	Not needed-----	Slope, fast intake.	Slope, too sandy, soil blowing.	Favorable.
44, 45, 46-------- Troup	Severe: seepage.	Severe: piping.	Severe: no water.	Not needed-----	Droughty, fast intake, slope.	Slope, too sandy, soil blowing.	Droughty, slope.
47*: Troup----------	Severe: seepage.	Severe: piping.	Severe: no water.	Not needed-----	Droughty, fast intake, slope.	Slope, too sandy, soil blowing.	Droughty, slope.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
47*:							
Orangeburg	Moderate: seepage.	Slight	Severe: no water.	Not needed	Slope	Slope	Slope.
Cowarts	Slight	Slight	Severe: no water.	Not needed	Slope, percs slowly.	Percs slowly	Slope, percs slowly.
48*. Urban land							

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1----------	0-47	Loamy sand------	SM	A-2	0	100	100	75-90	12-23	---	NP
Albany	47-52	Sandy loam------	SM	A-2	0	100	100	75-92	22-30	---	NP
	52-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	97-100	95-100	70-100	25-50	<40	NP-17
2----------	0-4	Loam----------	SM, ML	A-4	0	100	100	85-99	36-65	---	NP
Angie Variant	4-7	Loam, fine sandy loam.	SM, ML, SM-SC, CL-ML	A-4	0	100	100	85-99	36-70	<30	NP-7
	7-76	Clay, clay loam, sandy clay loam.	CH, CL	A-7	0	100	100	85-99	55-85	41-65	20-40
3*:											
Bibb----------	0-42	Silt loam-------	SM, SM-SC, ML, CL-ML	A-2, A-4	0-5	95-100	90-100	60-90	30-60	<25	NP-7
	42-65	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
Kinston----------	0-18	Silt loam-------	ML, CL, CL-ML	A-4	0	100	98-100	85-97	65-97	17-35	4-10
	18-50	Loam, clay loam, sandy clay loam.	CL	A-4, A-6	0	100	95-100	75-95	60-95	20-40	8-18
	50-65	Variable--------	---	---	0	---	---	---	---	---	---
4*:											
Bohicket----------	0-15	Clay------------	CH, MH	A-7	0	100	99-100	98-100	90-100	60-100	30-60
	15-45	Silty clay, clay	CH, MH	A-7	0	100	99-100	80-100	70-95	50-100	19-60
	45-80	Variable--------	---	---	---	---	---	---	---	---	---
Handsboro---------	0-20	Muck------------	Pt	---	---	---	---	---	---	---	---
	20-80	Stratified sapric material to clay.	Pt	---	---	---	---	---	---	---	---
5----------	0-47	Loamy sand------	SM	A-2-4	0	98-100	98-100	70-95	13-20	---	NP
Bonifay	47-63	Sandy loam, sandy clay loam.	SM-SC, SC, SM	A-2-4, A-4	0	95-100	90-100	70-95	30-50	<30	NP-10
6*:											
Chewacla----------	0-7	Silt loam-------	ML	A-4, A-5, A-6, A-7	0	98-100	95-100	70-100	55-90	36-50	4-18
	7-43	Silt loam, silty clay loam, clay loam.	ML, MH	A-4, A-5, A-6, A-7	0	96-100	95-100	80-100	51-98	36-56	4-20
	43-47	Sandy clay loam, loam, sandy loam.	SM, CL-ML, SM-SC, ML	A-4	0	96-100	95-100	60-80	36-70	<35	NP-7
	47-63	Variable--------	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
6*:											
Wahee	0-8	Loam	ML, CL-ML, CL	A-4	0	100	100	90-98	51-75	20-35	2-10
	8-65	Clay, clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	70-90	41-60	18-32
Riverview	0-4	Silt loam	CL, CL-ML	A-4	0	100	100	90-100	60-80	15-30	5-10
	4-36	Loamy fine sand, sandy loam, silty clay loam.	SM, SC, ML, CL	A-2, A-4, A-6	0	100	100	80-95	20-80	<40	NP-20
	36-64	Loamy sand, sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-20	---	NP
7*:											
Dorovan	0-63	Muck	Pt	---	0	---	---	---	---	---	---
Pamlico	0-37	Muck	Pt	---	0	---	---	---	---	---	---
	37-60	Loamy sand, sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-20	---	NP
8	0-13	Fine sandy loam	SM, SM-SC	A-2, A-4	0	95-100	92-100	75-90	20-40	<25	NP-5
Dothan	13-43	Sandy clay loam, sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	92-100	68-90	23-45	<40	NP-15
	43-63	Sandy clay loam, sandy clay.	SM-SC, SC, SM	A-2, A-4, A-6, A-7	0	95-100	92-100	70-95	30-50	25-45	4-18
9	0-14	Fine sandy loam	SM, SM-SC	A-2, A-4	0	95-100	92-100	75-90	20-40	<25	NP-5
Dothan	14-43	Sandy clay loam, sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	92-100	68-90	23-45	<40	NP-15
	43-60	Sandy clay loam, sandy clay.	SM-SC, SC, SM	A-2, A-4, A-6, A-7	0	95-100	92-100	70-95	30-50	25-45	4-18
10	0-15	Fine sandy loam	SM, SM-SC	A-2, A-4	0	95-100	92-100	75-90	20-40	<25	NP-5
Dothan	15-43	Sandy clay loam, sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	92-100	68-90	23-45	<40	NP-15
	43-63	Sandy clay loam, sandy clay.	SM-SC, SC, SM	A-2, A-4, A-6, A-7	0	95-100	92-100	70-95	30-50	25-45	4-18
11	0-10	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0	95-100	95-100	70-90	40-65	10-25	NP-7
Escambia	10-19	Fine sandy loam, loam, silt loam.	SC, SM-SC, CL, CL-ML	A-4, A-6	0	95-100	95-100	70-90	40-75	15-30	5-15
	19-65	Fine sandy loam, loam, silt loam.	SC, CL	A-4, A-6	0	85-95	85-95	60-90	35-80	20-35	8-20
12	0-7	Loam	ML, SM, SP-SM	A-2, A-4	0	90-100	90-100	44-85	10-56	<25	NP-7
Esto	7-12	Clay loam, sandy clay, sandy clay loam.	CL, SC	A-6, A-7	0	95-100	95-100	90-100	45-90	35-50	12-25
	12-78	Clay loam, clay, sandy clay.	CL, CH, MH	A-6, A-7	0	95-100	95-100	90-100	51-94	35-80	18-52

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	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	
13---------- Esto	0-7	Loam----------	ML, SM, SP-SM	A-2, A-4	0	90-100	90-100	44-85	10-56	<25	NP-7
	7-15	Clay loam, sandy clay, sandy clay loam.	CL, SC	A-6, A-7	0	95-100	95-100	90-100	45-90	35-50	12-25
	15-63	Clay loam, clay, sandy clay.	CL, CH, MH	A-6, A-7	0	95-100	95-100	90-100	51-90	35-55	18-30
14---------- Fuquay	0-26	Loamy sand------	SP-SM, SM	A-2, A-3	0	95-100	90-100	50-83	5-35	---	NP
	26-43	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	85-100	85-100	60-80	23-45	<25	NP-13
	43-59	Sandy clay loam	SC, CL	A-2, A-4, A-6	0	95-100	90-100	60-93	28-55	20-39	8-25
	59-80	Sandy loam, loamy sand.	SP-SM, SM	A-2, A-3	0	95-100	90-100	50-83	5-35	---	NP
15---------- Fuquay	0-30	Loamy sand------	SP-SM, SM	A-2, A-3	0	95-100	90-100	50-83	5-35	---	NP
	30-35	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	85-100	85-100	60-80	23-45	<25	NP-13
	35-63	Sandy clay loam	SC, CL	A-2, A-4, A-6	0	95-100	90-100	60-93	28-55	20-39	8-25
16---------- Garcon	0-8	Loamy fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	80-95	8-20	---	NP
	8-31	Loamy fine sand, loamy sand, fine sand.	SP-SM, SM	A-2-4, A-3	0	100	100	80-95	8-20	---	NP
	31-51	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC	A-2-4	0	100	100	80-95	18-30	<25	NP-7
	51-58	Loamy fine sand, loamy sand.	SP-SM, SM	A-2-4	0	100	100	75-95	11-20	---	NP
	58-80	Fine sand, sand	SP-SM, SP	A-3	0	100	100	75-95	4-10	---	NP
17*. Gullied land											
18---------- Johns	0-19	Fine sandy loam	SM, SM-SC	A-2, A-4	---	100	95-100	60-90	15-45	<20	NP-7
	19-35	Sandy clay loam, sandy loam.	SC, SM-SC, CL	A-2, A-4, A-6	---	100	95-100	60-90	30-55	20-35	4-15
	35-63	Sand, loamy sand	SM, SP-SM, SP	A-2, A-3	---	95-100	95-100	51-90	4-25	---	NP
19---------- Kalmia	0-14	Loamy fine sand	SM, SM-SC, SC	A-2	0	100	95-100	50-75	15-40	<25	NP-10
	14-39	Sandy clay loam	SC, SM-SC	A-2, A-4, A-6	0	100	95-100	70-90	30-49	20-35	4-15
	39-65	Loamy sand, sand	SM, SP-SM, SP	A-2, A-3	0	100	95-100	50-70	4-25	---	NP
20---------- Kureb	0-80	Sand----------	SP	A-3	0	100	100	60-100	0-5	---	NP
21---------- Lakeland	0-62	Sand----------	SP-SM	A-3, A-2-4	0	90-100	90-100	60-100	5-12	---	NP
	62-83	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	90-100	90-100	50-100	1-12	---	NP

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
22---------- Lakeland	0-57	Sand----------	SP-SM	A-3, A-2-4	0	90-100	90-100	60-100	5-12	---	NP
	57-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	90-100	90-100	50-100	1-12	---	NP
23---------- Lakeland	0-49	Sand----------	SP-SM	A-3, A-2-4	0	90-100	90-100	60-100	5-12	---	NP
	49-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	90-100	90-100	50-100	1-12	---	NP
24---------- Leon	0-16	Sand----------	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	16-32	Sand, fine sand	SM, SP-SM, SP	A-3, A-2-4	0	100	100	80-100	3-20	---	NP
	32-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
25---------- Lucy	0-26	Loamy sand------	SM, SP-SM	A-2	0	98-100	95-100	50-87	10-30	---	NP
	26-34	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	97-100	95-100	55-95	15-50	10-30	NP-15
	34-80	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	5-20
26---------- Lucy	0-28	Loamy sand------	SM, SP-SM	A-2	0	98-100	95-100	50-87	10-30	---	NP
	28-35	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	97-100	95-100	55-95	15-50	10-30	NP-15
	35-80	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	5-20
27---------- Lynchburg	0-9	Fine sandy loam, loam.	CL-ML, SM, SM-SC, ML	A-2, A-4	0	92-100	90-100	75-100	25-65	<30	NP-7
	9-80	Sandy clay loam, sandy loam, loam, clay loam.	SM-SC, SC, CL, CL-ML	A-2, A-4, A-6	0	92-100	90-100	70-100	25-67	15-40	4-18
28---------- Maxton	0-14	Loamy fine sand	SM, SM-SC, SC	A-2	0-3	90-100	85-100	65-90	15-30	<25	NP-10
	14-38	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
	38-72	Stratified loamy sand to sand.	SM, SP-SM, SP	A-2, A-3	0-3	90-100	75-100	50-90	4-25	---	NP
29---------- Mulat	0-10	Loamy fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	80-95	8-20	---	NP
	10-27	Loamy fine sand, loamy sand, fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	80-95	8-20	---	NP
	27-49	Sandy loam, fine sandy loam, sandy clay loam.	SM-SC, SC	A-2-4	0	100	100	80-95	20-35	20-30	4-10
	49-80	Fine sand, sand	SP, SP-SM	A-3	0	100	100	75-95	4-10	---	NP
30---------- 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	70-84	25-35	<30	NP-4
	14-73	Sandy clay loam	SC, CL	A-6, A-4	0	98-100	95-100	71-91	38-55	22-40	8-19

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	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	
31---------- Orangeburg	0-10	Sandy loam------	SM	A-2	0	98-100	95-100	75-95	20-35	---	NP
	10-18	Sandy loam------	SM	A-2	0	98-100	95-100	70-84	25-35	<30	NP-4
	18-73	Sandy clay loam	SC, CL	A-6, A-4	0	98-100	95-100	71-91	38-55	22-40	8-19
32---------- Orangeburg	0-11	Sandy loam------	SM	A-2	0	98-100	95-100	75-95	20-35	---	NP
	11-18	Sandy loam------	SM	A-2	0	98-100	95-100	70-84	25-35	<30	NP-4
	18-73	Sandy clay loam	SC, CL	A-6, A-4	0	98-100	95-100	71-91	38-55	22-40	8-19
33---------- Ortega	0-88	Sand------------	SP, SP-SM	A-3	0	100	100	90-100	3-8	---	NP
34---------- Pactolus	0-52	Loamy sand------	SM	A-2	0	100	90-100	51-95	13-30	---	NP
	52-80	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2, A-3	0	100	90-100	51-95	5-30	---	NP
35---------- Pickney	0-35	Loamy sand------	SM, SP-SM	A-2	0	100	100	50-90	10-25	---	NP
	35-70	Loamy fine sand, loamy sand, fine sand.	SP, SP-SM, SM	A-2, A-3	0	100	100	50-90	3-25	---	NP
36*. Pits											
37---------- Rains	0-9	Fine sandy loam	SM, ML, CL, SC	A-2, A-4	0	100	95-100	50-85	25-56	<35	NP-10
	9-50	Sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	98-100	65-98	30-70	18-40	4-18
	50-63	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7	0	100	98-100	65-98	36-72	18-45	4-22
38---------- Red Bay	0-8	Sandy loam------	SM	A-2, A-4	0	100	95-100	60-85	15-45	<20	NP-4
	8-14	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4	0	100	95-100	60-85	15-50	<35	NP-10
	14-80	Sandy clay loam	SM-SC, SC	A-2, A-4, A-6	0	100	95-100	70-90	24-50	18-40	4-16
39---------- Red Bay	0-6	Sandy loam------	SM	A-2, A-4	0	100	95-100	60-85	15-45	<20	NP-4
	6-12	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4	0	100	95-100	60-85	15-50	<35	NP-10
	12-80	Sandy clay loam	SM-SC, SC	A-2, A-4, A-6	0	100	95-100	70-90	24-50	18-40	4-16
40---------- Rutlege	0-21	Loamy sand------	SM, SP-SM	A-2, A-3	0	95-100	95-100	50-80	5-35	<25	NP
	21-61	Sand, loamy sand, loamy fine sand.	SP-SM, SP, SM	A-2, A-3	0	95-100	95-100	50-80	2-25	<20	NP
41---------- Tifton	0-8	Sandy loam------	SM, SM-SC	A-2	0	70-95	60-89	55-89	15-30	<30	NP-6
	8-30	Sandy loam, sandy clay loam.	SM, SM-SC	A-2	0	70-95	56-89	55-89	20-35	<25	NP-7
	30-58	Sandy clay loam	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	70-95	65-89	60-81	33-53	22-40	5-20
	58-70	Sandy clay loam	SC, CL	A-2, A-6, A-7	0	87-100	80-99	70-94	34-55	24-45	11-21

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
42----------	0-9	Sandy loam------	SM, SM-SC	A-2	0	70-95	60-89	55-89	15-30	<30	NP-6
Tifton	9-14	Sandy loam, sandy clay loam.	SM, SM-SC	A-2	0	70-95	56-89	55-89	20-35	<25	NP-7
	14-33	Sandy clay loam	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	70-95	65-89	60-81	33-53	22-40	5-20
	33-70	Sandy clay loam	SC, CL	A-2, A-6, A-7	0	87-100	80-99	70-94	34-55	24-45	11-21
43----------	0-6	Sandy loam------	SM, SM-SC	A-2	0	70-95	60-89	55-89	15-30	<30	NP-6
Tifton	6-11	Sandy loam, sandy clay loam.	SM, SM-SC	A-2	0	70-95	56-89	55-89	20-35	<25	NP-7
	11-44	Sandy clay loam	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	70-95	65-89	60-81	33-53	22-40	5-20
	44-70	Sandy clay loam	SC, CL	A-2, A-6, A-7	0	87-100	80-99	70-94	34-55	24-45	11-21
44----------	0-55	Loamy sand------	SM, SP-SM	A-2	0	100	100	50-75	10-30	---	NP
Troup	55-80	Sandy clay loam, sandy loam.	SC, CL, SM-SC, CL-ML	A-4, A-2	0	95-100	95-100	70-90	24-55	19-30	4-10
45----------	0-60	Loamy sand------	SM, SP-SM	A-2	0	100	100	50-75	10-30	---	NP
Troup	60-80	Sandy clay loam, sandy loam.	SC, CL SM-SC, CL-ML	A-4, A-2	0	95-100	95-100	70-90	24-55	19-30	4-10
46----------	0-65	Loamy sand------	SM, SP-SM	A-2	0	100	100	50-75	10-30	---	NP
Troup	65-80	Sandy clay loam, sandy loam.	SC, CL, SM-SC, CL-ML	A-4, A-2	0	95-100	95-100	70-90	24-55	19-30	4-10
47*:											
Troup----------	0-54	Loamy sand------	SM, SP-SM	A-2	0	100	100	50-75	10-30	---	NP
	54-80	Sandy loam------	SM	A-2	0	100	100	70-85	25-35	<30	NP-4
Orangeburg--------	0-6	Sandy loam------	SM	A-2	0	98-100	95-100	75-95	20-35	---	NP
	6-14	Sandy loam------	SM	A-2	0	98-100	95-100	70-84	25-35	<30	NP-4
	14-80	Sandy clay loam	SC, CL	A-6, A-4	0	98-100	95-100	71-91	38-55	22-40	8-19
Cowarts----------	0-14	Fine sandy loam	SM, SM-SC	A-2, A-4	0	95-100	90-100	75-90	20-40	<20	NP-5
	14-36	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	23-45	20-40	NP-15
	36-65	Sandy clay loam, sandy clay.	SC	A-6, A-7	0	95-100	90-100	60-90	25-50	30-50	11-23
48*. Urban land											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	mmhos/cm				
1----------	0-47	6.0-20	0.02-0.04	4.5-6.5	<2	Low-------	0.17	5	2
Albany	47-52	2.0-6.0	0.08-0.10	4.5-6.0	<2	Low-------	0.20		
	52-80	0.6-2.0	0.10-0.16	4.5-6.0	<2	Low-------	0.24		
2----------	0-4	0.2-2.0	0.15-0.20	3.6-5.5	<2	Low-------	0.24	3	3
Angie Variant	4-7	0.2-2.0	0.10-0.15	3.6-5.5	<2	High------	0.37		
	7-76	<0.2	0.10-0.15	3.6-5.5	<2	High------	0.32		
3*:									
Bibb----------	0-42	0.6-2.0	0.12-0.18	4.5-5.5	<2	Low-------	0.20	5	---
	42-65	0.6-2.0	0.12-0.20	4.5-5.5	<2	Low-------	0.37		
Kinston---------	0-18	0.6-2.0	0.14-0.20	4.5-6.0	<2	Low-------	0.24	---	---
	18-50	0.6-2.0	0.14-0.18	4.5-5.5	<2	Low-------	0.32		
	50-65	---	---	---	---	----------	---		
4*:									
Bohicket--------	0-15	0.06-0.2	0.14-0.18	6.1-8.4	>8	High------	0.32	5	---
	15-45	<0.06	0.12-0.16	6.1-8.4	>8	High------	0.24		
	45-80	---	---	---	---	----------	---		
Handsboro-------	0-20	0.6-2.0	0.20-0.30	6.6-8.4	>16	Low-------	---	---	---
	20-80	---	---	6.6-8.4	>16	----------	---		
5----------	0-47	6.0-20	0.05-0.10	4.5-5.5	<2	Low-------	0.17	5	2
Bonifay	47-63	0.6-2.0	0.10-0.15	4.5-5.5	<2	Low-------	0.24		
6*:									
Chewacla--------	0-7	0.6-2.0	0.15-0.24	4.5-6.5	<2	Low-------	0.28	4	---
	7-43	0.6-2.0	0.15-0.24	4.5-6.5	<2	Low-------	0.32		
	43-47	0.6-2.0	0.12-0.20	4.5-6.5	<2	Low-------	0.28		
	47-63	6.0-20.0	0.03-0.06	4.5-6.5	<2	Very low--	---		
Wahee----------	0-8	0.2-2.0	0.15-0.20	4.5-5.5	<2	Low-------	0.28	5	---
	8-65	0.06-0.2	0.12-0.20	4.5-5.5	<2	Moderate	0.28		
Riverview-------	0-4	0.6-2.0	0.16-0.24	4.5-5.5	<2	Low-------	0.28	4	---
	4-36	2.0-6.0	0.07-0.11	4.5-5.5	<2	Very low	0.17		
	36-64	6.0-20.0	0.03-0.06	4.5-5.5	<2	Very low	---		
7*:									
Dorovan---------	0-63	0.6-2.0	0.25-0.50	4.5-5.5	<2	----------	---	---	---
Pamlico---------	0-37	0.6-2.0	0.24-0.50	3.6-4.4	<2	----------	---	---	---
	37-60	6.0-20	0.03-0.06	3.6-5.5	<2	Low-------	---		
8----------	0-13	2.0-6.0	0.08-0.13	4.5-5.5	<2	Very low	0.24	4	3
Dothan	13-43	0.6-2.0	0.10-0.14	4.5-5.5	<2	Low-------	0.28		
	43-63	0.2-0.6	0.08-0.12	4.5-5.5	<2	Low-------	0.28		
9----------	0-14	2.0-6.0	0.08-0.13	4.5-5.5	<2	Very low	0.24	4	3
Dothan	14-43	0.6-2.0	0.10-0.14	4.5-5.5	<2	Low-------	0.28		
	43-60	0.2-0.6	0.08-0.12	4.5-5.5	<2	Low-------	0.28		
10----------	0-15	2.0-6.0	0.08-0.13	4.5-5.5	<2	Very low	0.24	4	3
Dothan	15-43	0.6-2.0	0.10-0.14	4.5-5.5	<2	Low-------	0.28		
	43-63	0.2-0.6	0.08-0.12	4.5-5.5	<2	Low-------	0.28		
11----------	0-10	2.0-6.0	0.11-0.15	5.1-5.5	<2	Low-------	0.24	4	3
Escambia	10-19	0.6-2.0	0.15-0.20	4.5-5.5	<2	Low-------	0.24		
	19-65	0.06-0.6	0.12-0.18	4.5-5.5	<2	Low-------	0.28		

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	mmhos/cm				
12----------	0-7	6.0-20	0.06-0.10	4.5-5.5	<2	Low--------	0.24	3	3
Esto	7-12	0.6-2.0	0.12-0.17	4.5-5.5	<2	Moderate	0.32		
	12-78	0.06-0.2	0.12-0.18	4.5-5.5	<2	Moderate	0.32		
13----------	0-7	6.0-20	0.06-0.10	4.5-5.5	<2	Low--------	0.24	3	3
Esto	7-15	0.6-2.0	0.12-0.17	4.5-5.5	<2	Moderate	0.32		
	15-63	0.06-0.2	0.12-0.18	4.5-5.5	<2	Moderate	0.32		
14----------	0-26	>6.0	0.04-0.09	4.5-5.5	<2	Low--------	0.20	5	2
Fuquay	26-43	0.6-2.0	0.12-0.15	4.5-5.5	<2	Low--------	0.20		
	43-59	0.06-0.2	0.10-0.13	4.5-5.5	<2	Low--------	0.20		
	59-80	>6.0	0.04-0.09	4.5-5.5	<2	Low--------	0.20		
15----------	0-30	>6.0	0.04-0.09	4.5-5.5	<2	Low--------	0.20	5	2
Fuquay	30-35	0.6-2.0	0.12-0.15	4.5-5.5	<2	Low--------	0.20		
	35-63	0.06-0.2	0.10-0.13	4.5-5.5	<2	Low--------	0.20		
16----------	0-8	6.0-20	0.10-0.15	4.5-5.5	<2	Low--------	0.17	5	2
Garcon	8-31	6.0-20	0.05-0.10	4.5-5.5	<2	Low--------	0.17		
	31-51	0.6-2.0	0.10-0.15	4.5-5.5	<2	Low--------	0.24		
	51-58	0.6-2.0	0.07-0.10	4.5-5.5	<2	Low--------	0.17		
	58-80	6.0-20	0.05-0.08	4.5-5.5	<2	Low--------	0.17		
17*. Gullied land									
18----------	0-19	2.0-6.0	0.08-0.14	4.5-5.5	<2	Low--------	0.20	5	2
Johns	19-35	0.6-2.0	0.12-0.15	4.5-5.5	<2	Low--------	0.24		
	35-63	6.0-20	0.03-0.06	4.5-5.5	<2	Low--------	0.10		
19----------	0-14	2.0-6.0	0.06-0.10	4.5-6.0	<2	Low--------	0.20	4	3
Kalmia	14-39	0.6-2.0	0.12-0.16	4.5-5.5	<2	Low--------	0.24		
	39-65	6.0-20	0.03-0.06	4.5-5.5	<2	Low--------	0.10		
20----------	0-80	6.0-20	<0.05	4.5-7.3	<2	Low--------	0.17	4	1
Kureb									
21----------	0-62	>20	0.05-0.08	4.5-6.0	<2	Very low	0.17	5	2
Lakeland	62-83	>20	0.03-0.08	4.5-6.0	<2	Very low	---		
22----------	0-57	>20	0.05-0.08	4.5-6.0	<2	Very low	0.17	5	2
Lakeland	57-80	>20	0.03-0.08	4.5-6.0	<2	Very low	---		
23----------	0-49	>20	0.05-0.08	4.5-6.0	<2	Very low	0.17	5	2
Lakeland	49-80	>20	0.03-0.08	4.5-6.0	<2	Very low	---		
24----------	0-16	6.0-20	0.02-0.05	3.6-5.5	<2	Very low	0.20	5	2
Leon	16-32	0.6-6.0	0.05-0.10	3.6-5.5	<2	Very low	0.20		
	32-80	>20	0.02-0.05	3.6-5.5	<2	Very low	0.17		
25----------	0-26	6.0-20	0.06-0.10	5.1-5.5	<2	Low--------	0.20	5	2
Lucy	26-34	2.0-6.0	0.10-0.12	4.5-5.5	<2	Low--------	0.24		
	34-80	0.6-2.0	0.12-0.14	4.5-5.5	<2	Low--------	0.28		
26----------	0-28	6.0-20	0.06-0.10	5.1-5.5	<2	Low--------	0.20	5	2
Lucy	28-35	2.0-6.0	0.10-0.12	4.5-5.5	<2	Low--------	0.24		
	35-80	0.6-2.0	0.12-0.14	4.5-5.5	<2	Low--------	0.28		
27----------	0-9	2.0-6.0	0.09-0.13	3.6-5.5	<2	Low--------	0.20	4	3
Lynchburg	9-80	0.6-2.0	0.12-0.16	3.6-5.5	<2	Low--------	0.20		
28----------	0-14	2.0-6.0	0.06-0.10	4.5-6.0	<2	Low--------	0.20	4	2
Maxton	14-38	0.6-2.0	0.13-0.18	4.5-5.5	<2	Low--------	0.24		
	38-72	6.0-20	0.03-0.06	4.5-5.5	<2	Low--------	0.10		

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	mmhos/cm				
29----------	0-10	6.0-20	0.10-0.15	4.5-5.5	<2	Low-------	0.17	5	2
Mulat	10-27	6.0-20	0.05-0.10	4.5-5.5	<2	Low-------	0.17		
	27-49	0.2-0.6	0.10-0.15	4.5-5.5	<2	Low-------	0.24		
	49-80	6.0-20	0.05-0.08	3.6-5.5	<2	Low-------	0.17		
30----------	0-8	2.0-6.0	0.07-0.10	4.5-6.0	<2	Low-------	0.24	5	3
Orangeburg	8-14	2.0-6.0	0.07-0.10	4.5-5.5	<2	Low-------	0.24		
	14-73	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low-------	0.24		
31----------	0-10	2.0-6.0	0.07-0.10	4.5-6.0	<2	Low-------	0.24	5	3
Orangeburg	10-18	2.0-6.0	0.07-0.10	4.5-5.5	<2	Low-------	0.24		
	18-73	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low-------	0.24		
32----------	0-11	2.0-6.0	0.07-0.10	4.5-6.0	<2	Low-------	0.24	5	3
Orangeburg	11-18	2.0-6.0	0.07-0.10	4.5-5.5	<2	Low-------	0.24		
	18-73	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low-------	0.24		
33----------	0-88	6.0-20	0.03-0.06	4.5-6.5	<2	Low-------	0.15	5	2
Ortega									
34----------	0-52	6.0-20	0.05-0.10	4.5-6.0	<2	Low-------	0.15	5	2
Pactolus	52-80	6.0-20	0.03-0.07	4.5-5.5	<2	Low-------	0.10		
35----------	0-35	6.0-20	0.07-0.12	3.6-5.5	<2	Very low	0.10	5	---
Pickney	35-70	6.0-20	0.03-0.11	4.5-6.0	<2	Very low	0.10		
36*.									
Pits									
37----------	0-9	2.0-6.0	0.08-0.12	4.5-6.5	<2	Low-------	0.17	5	---
Rains	9-50	0.6-2.0	0.10-0.15	4.5-5.5	<2	Low-------	0.24		
	50-63	0.6-2.0	0.10-0.15	4.5-5.5	<2	Low-------	0.28		
38----------	0-8	2.0-6.0	0.07-0.14	4.5-6.0	<2	Low-------	0.15	5	3
Red Bay	8-14	0.6-6.0	0.10-0.14	4.5-5.5	<2	Low-------	0.15		
	14-80	0.6-2.0	0.10-0.17	4.5-5.5	<2	Low-------	0.17		
39----------	0-6	2.0-6.0	0.07-0.14	4.5-6.0	<2	Low-------	0.15	5	3
Red Bay	6-12	0.6-6.0	0.10-0.14	4.5-5.5	<2	Low-------	0.15		
	12-80	0.6-2.0	0.10-0.17	4.5-5.5	<2	Low-------	0.17		
40----------	0-21	6.0-20	0.04-0.10	3.6-5.0	<2	Low-------	0.17	5	---
Rutlege	21-61	6.0-20	0.04-0.08	3.6-5.0	<2	Low-------	0.17		
41----------	0-8	6.0-20	0.06-0.10	4.5-5.5	<2	Low-------	0.20	4	3
Tifton	8-30	6.0-20	0.08-0.12	4.5-5.5	<2	Low-------	0.24		
	30-58	0.6-2.0	0.12-0.15	4.5-5.5	<2	Low-------	0.24		
	58-70	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low-------	0.17		
42----------	0-9	6.0-20	0.06-0.10	4.5-5.5	<2	Low-------	0.20	4	3
Tifton	9-14	6.0-20	0.08-0.12	4.5-5.5	<2	Low-------	0.24		
	14-33	0.6-2.0	0.12-0.15	4.5-5.5	<2	Low-------	0.24		
	33-70	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low-------	0.17		
43----------	0-6	6.0-20	0.06-0.10	4.5-5.5	<2	Low-------	0.20	4	3
Tifton	6-11	6.0-20	0.08-0.12	4.5-5.5	<2	Low-------	0.24		
	11-44	0.6-2.0	0.12-0.15	4.5-5.5	<2	Low-------	0.24		
	44-70	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low-------	0.17		
44----------	0-55	6.0-20	0.03-0.10	4.5-5.5	<2	Very low	0.20	5	2
Troup	55-80	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low-------	0.20		
45----------	0-60	6.0-20	0.03-0.10	4.5-5.5	<2	Very low	0.20	5	2
Troup	60-80	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low-------	0.20		
46----------	0-65	6.0-20	0.03-0.10	4.5-5.5	<2	Very low	0.20	5	2
Troup	65-80	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low-------	0.20		

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	mmhos/cm				
47*:									
Troup----------	0-54	6.0-20	0.03-0.10	4.5-5.5	<2	Very low	0.20	5	2
	54-80	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low-------	0.20		
Orangeburg------	0-6	2.0-6.0	0.07-0.10	4.5-6.0	<2	Low-------	0.24	5	3
	6-14	2.0-6.0	0.07-0.10	4.5-5.5	<2	Low-------	0.24		
	14-80	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low-------	0.24		
Cowarts---------	0-14	2.0-6.0	0.08-0.13	4.5-5.5	<2	Low-------	0.24	3	3
	14-36	0.6-2.0	0.10-0.14	4.5-5.5	<2	Low-------	0.28		
	36-65	0.2-2.0	0.10-0.16	4.5-5.5	<2	Low-------	0.28		
48*. Urban land									

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--SOIL AND WATER FEATURES

[The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
1---------- Albany	C	Rare--------	---	---	1.0-2.5	Apparent	Dec-Mar	>60	---	High-----	High.
2---------- Angie Variant	C	Rare--------	---	---	2.5-4.0	Apparent	Mar-Sep	>60	---	High-----	High.
3*:											
Bibb----------	C	Frequent----	Brief-----	Dec-May	0.5-1.5	Apparent	Dec-Apr	>60	---	High-----	Moderate.
Kinston----------	D	Frequent----	Brief-----	Nov-Jun	0-1.0	Apparent	Nov-Jun	>60	---	High-----	High.
4*:											
Bohicket---------	D	Frequent----	Very brief	Jan-Dec	+3-0	Marsh	Jan-Dec	>60	---	High-----	High.
Handsboro--------	D	Frequent----	Very long	Jan-Dec	+3-0.5	Marsh	Jan-Dec	>60	---	High-----	High.
5---------- Bonifay	A	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
6*:											
Chewacla---------	C	Common------	Brief-----	Nov-Apr	0.5-1.5	Apparent	Nov-Apr	>60	---	High-----	Moderate.
Wahee----------	D	Frequent----	Brief-----	Dec-Apr	0.5-1.5	Apparent	Dec-Mar	>60	---	High-----	High.
Riverview--------	B	Common------	Brief-----	Dec-Mar	3.0-5.0	Apparent	Dec-Mar	>60	---	Low------	Moderate.
7*:											
Dorovan----------	D	Frequent----	Very long	Jan-Dec	+1-0.5	Swamp	Jan-Dec	>60	---	High-----	High.
Pamlico----------	D	Frequent----	Very long	Nov-Jun	+1-1.0	Swamp	Nov-Jul	>60	---	High-----	High.
8, 9, 10---------- Dothan	B	None--------	---	---	3.5-4.0	Perched	Jan-Apr	>60	---	Moderate	Moderate.
11---------- Escambia	C	None--------	---	---	1.5-2.5	Apparent	Dec-Mar	>60	---	Moderate	High.
12, 13---------- Esto	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
14, 15---------- Fuquay	B	None--------	---	---	2.5-4.0	Perched	Jan-Mar	>60	---	Low------	High.
16---------- Garcon	C	None--------	---	---	1.5-3.0	Apparent	Jan-Apr	>60	---	High-----	High.
17*. Gullied land											
18---------- Johns	C	Rare--------	---	---	1.5-3.0	Apparent	Nov-Apr	>60	---	Moderate	High.
19---------- Kalmia	B	None to rare	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
20---------- Kureb	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low.
21, 22, 23-------- Lakeland	A	None--------	---	---	>6.0	---	---	>72	---	Low------	Moderate.
24---------- Leon	A/D	None--------	---	---	0-1.0	Apparent	Jun-Feb	>60	---	High-----	High.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
25, 26--- Lucy	A	None	---	---	>6.0	---	---	>60	---	Low	High.
27--- Lynchburg	B/D	None	---	---	0.5-1.5	Apparent	Nov-Apr	>60	---	High	High.
28--- Maxton	B	Rare	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
29--- Mulat	D	Rare	---	---	0-1	Apparent	Dec-Jun	>60	---	High	High.
30, 31, 32--- Orangeburg	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
33--- Ortega	A	None	---	---	3.5-5.0	Apparent	Jun-Jan	>60	---	Low	High.
34--- Pactolus	C	None to rare	---	---	1.5-2.5	Apparent	Jan-Mar	>60	---	Low	High.
35--- Pickney	D	Common	Very long	Dec-Mar	0-1.0	Apparent	Dec-Mar	>60	---	High	High.
36*. Pits											
37--- Rains	B/D	Rare	---	---	0-1.0	Apparent	Nov-Apr	>60	---	High	High.
38, 39--- Red Bay	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
40--- Rutlege	D	Common	Brief	Dec-May	0-1.0	Apparent	Dec-May	>60	---	High	High.
41, 42, 43--- Tifton	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
44, 45, 46--- Troup	A	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
47*:											
Troup---	A	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
Orangeburg---	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Cowarts---	C	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
48*. Urban land											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--DEPTH TO WATER TABLE AT SELECTED SITES

[Absence of an entry indicates that no determination was made that month. > means greater than]

Soil and elevation	Year	Depth to water table* in inches											
		June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Albany:	1974-75	55	>60	>60	38	52	>60	>60	49	30	13	13	21
220 ft.	1975-76	32	28	13	30	24	20	22	13	23	32	21	36
	1976-77	26	37	>60	42	41	42	8	4	20	19	16	35
Albany:	1974-75	>60	>60	>60	47	>60	>60	>60	>60	>60	60	39	32
135 ft.	1975-76	24	32	13	31	24	21	18	20	24	27	21	42
	1976-77	29	57	>60	>60	>60	>60	49	40	42	46	19	37
Dothan:	1974-75	93	>96	73	56	76	>96	>96	70	29	23	14	32
150 ft.	1975-76	35	27	15	52	29	25	40	41	43	70	29	60
	1976-77	35	57	>96	85	>96	>96	16	12	34	42	21	52
Escambia:	1974-75	33	55	14	26	55	72	70	27	15	12	13	14
90 ft.	1975-76	4	22	15	16	19	19	13	11	15	16	12	29
	1976-77	21	20	40	23	42	33	6	4	15	14	16	26
Escambia:	1974-75	57	76	22	36	63	74	66	49	47	28	18	16
65 ft.	1975-76	12	25	10	14	12	31	12	11	16	15	10	21
	1976-77	23	23	45	36	49	45	16	8	19	20	16	26
Pactolus:	1974-75	40	>60	48	28	46	56	37	17	13	9	10	13
200 ft.	1975-76	15	25	11	19	20	15	11	8	17	22	11	26
	1976-77	22	30	--	--	--	--	--	--	--	--	--	--
Pactolus:	1974-75	48	57	42	37	44	57	46	55	40	38	22	28
195 ft.	1975-76	33	29	3	11	9	7	3	4	10	12	5	18
	1976-77	12	10	21	18	24	30	12	3	20	19	20	25

* Monthly readings based on the average of two readings taken at the first and the middle of the month.

TABLE 17.--RAINFALL AT SELECTED SITES

[Absence of an entry indicates that no determination was made that month]

Soil and elevation	Year	Monthly rainfall* in inches											
		June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Albany:	1974-75	4.2	0.4	5.9	4.8	0.0	1.1	4.0	4.1	4.7	5.9	6.7	6.2
220 ft.	1975-76	5.5	3.5	26.6	6.2	8.5	7.7	3.4	5.5	2.5	2.3	4.5	4.6
	1976-77	7.7	3.0	4.5	7.7	3.5	3.9	6.2	4.8	2.4	4.2	5.3	4.3
Albany:	1974-75	4.8	0.8	8.1	6.1	0.3	--	--	--	3.7	--	5.6	5.6
135 ft.	1975-76	9.3	4.4	19.1	5.2	8.5	7.4	3.4	5.6	3.5	3.9	4.1	4.6
	1976-77	6.8	2.9	2.5	7.2	4.5	3.9	6.1	5.7	2.5	3.3	5.4	3.3
Dothan:	1974-75	5.6	3.0	8.5	5.9	1.1	2.2	4.9	4.2	4.7	5.3	8.4	7.1
150 ft.	1975-76	8.4	5.6	19.1	4.1	8.0	7.3	3.5	5.5	3.1	3.0	3.9	5.0
	1976-77	3.7	0.9	1.7	5.4	2.2	3.1	3.7	5.8	1.6	3.4	3.9	4.2
Escambia:	1974-75	5.8	1.3	9.0	7.6	0.4	2.0	4.1	4.4	3.7	4.8	5.9	7.2
90 ft.	1975-76	9.3	5.8	19.4	7.4	7.6	6.5	3.0	4.8	3.6	3.4	6.4	5.0
	1976-77	5.6	6.4	4.6	8.1	2.9	3.5	4.0	5.4	2.4	3.3	5.8	4.3
Escambia:	1974-75	--	--	--	6.1	--	--	2.8	3.3	3.7	4.4	6.1	7.2
65 ft.	1975-76	--	5.7	17.0	7.4	8.4	1.9	2.0	4.6	3.0	3.4	4.4	4.6
	1976-77	6.8	6.4	3.2	8.0	3.4	3.3	4.3	5.1	2.0	2.7	5.9	2.7
Pactolus:	1974-75	--	--	7.7	7.0	0.3	2.4	4.2	5.1	5.0	5.6	9.6	6.4
200 ft.	1975-76	6.4	5.3	16.6	7.1	8.5	7.7	2.1	5.4	2.0	1.7	5.5	5.5
	1976-77	6.7	4.5	--	--	--	--	--	--	--	--	--	--
Pactolus:	1974-75	2.4	1.1	8.3	5.6	0.5	2.1	2.5	4.0	5.2	5.2	7.4	6.1
195 ft.	1975-76	6.5	5.2	17.2	7.1	8.2	7.5	2.0	5.1	2.3	3.6	4.5	5.3
	1976-77	6.5	6.2	4.0	8.9	3.6	4.0	4.8	5.2	2.4	4.6	5.8	4.8

* Monthly readings based on the average of two readings taken at the first and the middle of the month.

TABLE 18.--ENGINEERING TEST DATA

[Tests performed by the Florida Department of Transportation (FDOT) in cooperation with the U.S. Bureau of Public Roads, in accordance with standard procedures of the American Association of State Highway and Transportation Officials (AASHTO). NP means nonplastic]

Soil name and location	FDOT report number	Depth	Moisture density*		Mechanical analysis**							Liquid limit	Plasticity limit	Classification	
					Percentage passing sieve--			Percentage smaller than--							
			Maximum dry density	Optimum moisture content	No. 10 (2.0mm)	No. 40 (.42mm)	No. 200 (.074mm)	0.05mm	0.02mm	0.005mm	0.002mm			AASHTO***	Unified
		In	Pcf	Pct											
Albany loamy sand:															
Approximately 20 yards west of paved road, in NE1/4SE1/4 sec. 7, T. 2 N., R. 28 W.	53	17-25	120.0	9.5	100	81	18	15	11	4	4	--	NP	A-2-4 (0)	SM
	54	52-67	114.9	14.4	99	79	28	27	24	18	17	27	9	A-2-4 (0)	SC
Angie Variant:															
Approximately 1/4 mile east of Delaney Creek and 30 yards south of trail road, in SW1/4 SW1/4 sec. 20, T. 3 N., R. 30 W.	41	11-25	97.2	23.2	100	99	77	70	56	47	41	56	36	A-7 (19)	CH
	42	52-76	98.8	21.6	100	96	80	72	59	48	41	55	35	A-7 (19)	CH
Bonifay loamy sand:															
Approximately 4 miles east of State Highway 197 and 8 yards west of trail road, in SE1/4NW1/4 sec. 27, T. 3 N., R. 29 W.	10	0-4	102.1	16.1	100	75	17	10	0	0	0	--	NP	A-2-4 (0)	SM
	11	30-47	118.6	9.8	100	72	16	14	10	3	1	--	NP	A-2-4 (0)	SM
	12	51-63	119.1	12.3	98	71	22	21	17	16	14	--	NP	A-2-4 (0)	SM
Dothan loamy fine sand:															
Approximately 85 yards east of State Highway 191 and 20 yards south of trail road, in SE1/4SW1/4 sec. 34, T. 4 N., R. 27 W.	30	14-30	117.0	12.8	100	96	43	36	26	19	17	26	9	A-4 (2)	SC
	31	30-43	107.6	17.4	100	96	48	43	35	28	27	35	14	A-6 (4)	SC
	32	43-60	99.8	22.9	100	93	49	44	36	31	29	44	21	A-7-6 (7)	SC
Escambia sandy loam:															
Approximately 100 yards west of paved road, in NW1/4NW1/4 sec. 13, T. 2 N., R. 29 W.	22	14-19	119.7	11.8	100	92	40	34	24	13	10	--	NP	A-4 (0)	SM
	23	19-37	117.8	12.6	100	93	42	35	24	14	12	21	4	A-4 (1)	SM-SC
	24	37-65	118.2	11.7	100	91	41	33	19	13	11	22	4	A-4 (1)	SM-SC
Esto loam:															
Approximately 10 yards north of trail road and 1.6 miles south of State Highway 4, in SW1/4SE1/4 sec. 22, T. 4 N., R. 26 W.	55	12-24	86.0	29.0	100	100	94	92	86	74	66	74	46	A-7 (20)	CH
	56	34-78	79.7	24.6	100	100	90	97	94	86	79	80	52	A-7 (20)	CH
Fuquay loamy sand:															
Approximately 1/2 mile west of State Highway 87A, in NE1/4NW1/4 sec. 13, T. 2 N., R. 28 W.	57	7-26	121.5	10.1	100	83	27	22	14	7	5	--	NP	A-2-4 (0)	SM
	58	43-59	118.6	12.1	100	85	32	28	21	17	16	--	NP	A-2-4 (0)	SM

See footnote at end of table.

TABLE 18.--ENGINEERING TEST DATA--Continued

Soil name and location	FDOT report number	Depth	Moisture density*		Mechanical analysis**							Liquid limit	Plasticity limit	Classification	
			Maximum dry density	Optimum moisture content	Percentage passing sieve--			Percentage smaller than--						AASHTO***	Unified
					No. 10 (2.0mm)	No. 40 (.42mm)	No. 200 (.074mm)	0.05mm	0.02mm	0.005mm	0.002mm				
		In	Pcf	Pct											
Garcon fine sand:															
Approximately 2 miles south	62	20-31	111.0	11.6	100	93	16	14	10	6	4	--	NP	A-2-4 (0)	SM
of Interstate 10 and State	63	31-39	113.7	13.2	100	93	21	19	15	12	11	--	NP	A-2-4 (0)	SM
Highway 281 and 1/4 mile	64	39-51	112.2	14.7	100	94	19	18	15	13	13	--	NP	A-2-4 (0)	SM
south of Trout Bayou, in W1/2 sec. 14, T. 1 S., R. 28 W.															
Kalmia fine sandy loam:															
Approximately 15 yards north	51	19-31	109.1	16.3	100	100	47	36	25	22	19	24	5	A-4 (3)	SM-SC
of trail road and 3/4 mile	52	42-60	106.5	13.6	100	100	36	24	10	6	5	--	NP	A-4 (0)	SM
east of Escambia River, in NE1/4SW1/4 sec. 7, T. 4 N., R. 30 W.															
Kureb sand:															
Approximately 100 yards north	68	16-24	106.2	13.5	100	89	7	6	5	2	2	--	NP	A-3 (0)	SP-SM
of U.S. Highway 98 and 20	69	24-80	103.6	14.1	100	89	5	4	2	2	1	--	NP	A-3 (0)	SP-SM
yards east of paved road, in SE1/4SE1/4 sec. 23, T. 2 S., R. 28 W.															
Lakeland sand:															
Approximately 0.6 mile north	1	8-32	113.1	10.6	100	73	12	10	7	4	3	--	NP	A-2-4 (0)	SP-SM
of Harold and 40 feet west of	2	32-62	113.0	11.0	100	74	11	9	8	4	2	--	NP	A-2-4 (0)	SP-SM
paved road, in NE1/4 sec. 19, T. 2 N., R. 26 W.	3	62-83	109.3	12.5	100	72	8	6	5	2	1	--	NP	A-3 (0)	SP-SM
Leon sand:															
Approximately 240 yards north of State Highway 191 and 30 yards east of graded road, in NW1/4SW1/4 sec. 25, T. 2 S., R. 28 W.	67	16-25	103.1	14.6	100	85	12	11	6	2	1	--	NP	A-2-4 (0)	SP-SM
Lucy loamy sand:															
Approximately 0.6 mile west	7	0-6	104.4	15.5	100	82	27	21	12	4	3	--	NP	A-2-4 (0)	SM
of State Highway 87 and 120	8	13-33	123.2	9.8	100	81	27	24	15	8	9	--	NP	A-2-4 (0)	SM
feet south of graded road, in NW1/4NW1/4 sec. 33, T. 4 N., R. 28 W.	9	39-72	116.1	13.7	100	84	36	32	27	24	22	24	11	A-6 (0)	SC
Lynchburg fine sandy loam:															
Approximately 1/4 mile south	35	9-17	119.0	11.7	100	99	64	52	31	14	11	21	4	A-4 (6)	CL-ML
of McDavid Creek and 50 yards	36	25-44	111.4	15.0	100	100	67	56	36	25	21	32	15	A-6 (8)	CL
west of graded road, in NE1/4SE1/4 sec. 20, T. 4 N., R. 30 W.	37	44-80	107.6	16.5	100	100	70	60	41	31	29	43	26	A-7 (14)	CL

See footnote at end of table.

TABLE 18.--ENGINEERING TEST DATA--Continued

Soil name and location	FDOT report number	Depth	Moisture density*		Mechanical analysis**							Liquid limit	Plasticity limit	Classification	
					Percentage passing sieve--			Percentage smaller than--							
			Maximum dry density	Optimum moisture content	No. 10 (2.0mm)	No. 40 (.42mm)	No. 200 (.074mm)	0.05mm	0.02mm	0.005mm	0.002mm			AASHTO***	Unified
		In	Pcf	Pct											
Maxton loamy sand:															
Approximately 3/4 mile east of Escambia River and 25 yards east of graded road, in NW1/4SE1/4 sec. 18, T. 3 N., R. 30 W.	43	19-32	107.0	16.4	100	98	65	56	40	32	2	39	18	A-6 (9)	CL
	44	38-59	112.0	13.1	100	86	21	14	7	4	--	--	NP	A-2-4 (0)	SM
Mulat loamy fine sand:															
Approximately 2 1/4 miles south of Interstate 10 and 200 feet east of State Highway 281, in S1/2 sec. 15, T. 1 S., R. 28 W.	60	27-49	115.5	13.2	100	85	22	21	19	16	16	24	9	A-2-4	SC
	61	57-80	103.9	8.6	100	78	5	5	4	4	2	--	NP	A-3 (0)	SP-SM
Orangeburg loamy sand:															
Approximately 3/4 mile east of State Highway 87 and 35 yards east of graded road, in SW1/4SE1/4 sec. 27, T. 4 N., R. 28 W.	14	25-47	116.6	14.0	100	89	45	42	35	35	25	28	14	A-6 (3)	SC
	15	47-73	118.9	13.0	100	89	41	37	30	26	23	24	12	A-6 (2)	SC
Pactolus loamy sand:															
Approximately 100 yards north of State Highway 182 and 75 yards east of graded road, in SE1/4SE1/4 sec. 7, T. 3 N., R. 29 W.	19	17-30	115.7	9.7	100	87	15	12	7	4	3	--	NP	A-2 (0)	SM
	20	30-52	111.3	12.4	100	86	12	10	5	1	1	--	NP	A-2 (0)	SP-SM
	21	52-80	104.9	13.5	100	[illegible]	6	3	1	0	0	--	NP	A-3 (0)	SP-SM
Red Bay sandy loam:															
Approximately 220 yards south of State Highway 89, in NW1/4NW1/4 sec. 1, T. 3 N., R. 29 W.	25	8-14	117.9	12.2	100	89	37	32	27	20	17	21	8	A-4 (0)	SC
	26	14-51	123.4	12.3	100	89	39	35	28	24	21	23	10	A-4 (0)	SC
	27	51-80	123.7	10.8	100	86	30	28	20	18	16	18	4	A-2-4 (0)	SM-SC
Rutlege loamy sand:															
Approximately 100 yards east of State Highway 184 and 125 yards south of East Milton School, in NW1/4SE1/4 sec. 2, T. 1 N., R. 28 W.	59	0-12	111.5	14.6	100	74	15	10	5	0	0	--	NP	A-2-4 (0)	SM
Tifton sandy loam:															
Approximately 1/8 mile west of State Highway 197 and 40 yards north of trail road, in SE1/4SW1/4 sec. 1, T. 3 N., R. 30 W.	47	8-30	121.3	13.3	100	89	45	40	32	23	19	26	13	A-6 (3)	SC
	48	42-58	110.3	17.5	100	88	48	43	45	27	24	40	16	A-6 (4)	SC

See footnote at end of table.

TABLE 18.--ENGINEERING TEST DATA--Continued

Soil name and location	FDOT report number	Depth	Moisture density*		Mechanical analysis**							Liquid limit	Plasticity limit	Classification	
					Percentage passing sieve--			Percentage smaller than--							
			Maximum dry density	Optimum moisture content	No. 10 (2.0mm)	No. 40 (.42mm)	No. 200 (.074mm)	0.05mm	0.02mm	0.005mm	0.002mm			AASHTO***	Unified
		In	Pcf	Pct											
Troup loamy sand:															
Approximately 1/2 mile south of State Highway 191 and 1/8 mile east of paved road, in NW1/4NW1/4 sec. 30, T. 2 N., R. 28 W.	4	3-21	114.1	11.7	100	76	16	16	11	6	4	NP	NP	A-2-4 (0)	SM
	5	21-39	115.6	10.6	100	76	15	14	11	6	5	NP	NP	A-2-4 (0)	SM
	6	39-55	120.0	12.5	100	77	24	22	20	19	18	19	4	A-2-4 (0)	SM-SC
Wahee:															
Approximately 100 yards south of State Highway 4, in SE1/4SE1/4 sec. 10, T. 5 N., R. 30 W.	28	14-40	100.2	21.6	100	98	85	68	44	31	25	38	23	A-6 (13)	CL
	29	40-65	99.6	20.5	100	99	83	77	57	39	33	46	28	A-7-6(17)	CL

* Based on AASHTO Designation T99-70 (1).

** Mechanical analysis according to AASHTO designation T88-70 (1). Results by this procedure differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHTO procedure, the fine material is analyzed by the hydrometer method and the various grain-sized fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-sized fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soil.

*** Based on AASHTO Designation M 145-49 (1).

TABLE 19.--PHYSICAL PROPERTIES OF SELECTED SOILS

Soil series and sample numbers	Depth	Horizon	Particle size distribution (Percent less than 2 mm)								Hydraulic conductivity	Bulk density (field moisture)	Water content by weight		
			Sand						Silt (0.05-0.002)	Clay <0.002			1/10 bar	1/3 bar	15 bar
			Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Total (2.0-0.05)							
	In										cm/hr	g/cc	Pct		
Albany:															
S57-37-1	0-5	A1	0.5	10.9	36.4	28.5	4.1	80.4	14.2	5.4	10.5	1.38	16.9	12.2	4.2
S57-37-2	5-17	A21	1.2	11.4	35.0	31.5	5.0	84.1	10.1	5.8	7.5	1.74	10.6	7.5	3.2
S57-37-3	17-25	A22	1.4	13.1	36.6	29.6	4.8	85.5	8.8	5.7	8.5	1.72	8.4	5.7	2.7
S57-37-4	25-47	A23	2.9	13.7	32.7	30.6	4.4	84.3	7.9	7.8	---	---	---	---	---
S57-37-5	47-52	B1	2.2	12.5	31.7	28.8	4.0	79.2	7.5	13.3	---	---	---	---	---
S57-37-6	52-67	B21t	4.4	14.0	31.3	20.5	2.8	73.0	7.8	19.2	---	---	---	---	---
S57-37-7	67-80	B22t	12.1	29.2	23.2	8.9	2.8	76.2	6.8	17.0	---	---	---	---	---
Angie Variant:															
S57-30-1	0-4	A1	0.2	1.2	2.1	14.4	28.7	46.6	40.8	12.6	0.3	1.34	29.0	23.3	10.4
S57-30-2	4-7	B1	0.3	1.4	2.0	15.3	26.2	46.3	34.1	19.5	0.1	1.55	22.4	18.4	9.4
S57-30-3	7-11	B21t	0.3	1.2	1.6	10.0	20.7	34.8	25.7	39.5	0.0	1.47	29.0	26.9	19.3
S57-30-4	11-25	B22t	0.3	1.1	1.1	7.2	14.9	25.2	15.7	59.1	0.0	1.44	30.7	30.1	22.4
S57-30-5	25-39	B23t	0.0	0.1	0.3	32.1	24.3	56.8	16.9	27.2	0.0	1.53	27.2	26.0	19.9
S57-30-6	39-52	B24tg	0.5	2.6	2.5	6.4	12.7	24.7	20.6	54.7	0.0	1.58	26.3	25.4	14.4
S57-30-7	52-76	B25tg	0.6	2.6	2.7	7.1	15.0	28.3	21.3	50.4	0.0	1.51	27.4	26.8	18.4
Bohicket:															
S57-45-1	0-15	A1g	0.1	0.5	2.1	3.5	9.3	15.5	23.6	60.9	---	---	---	---	---
S57-45-2	15-45	C1g	0.1	1.1	15.9	21.6	11.3	50.0	16.6	33.4	---	---	---	---	---
S57-45-3	45-80	IIC2g	0.1	2.6	38.7	34.1	10.9	86.4	7.5	6.1	---	---	---	---	---
Bonifay:															
S57-12-1	0-4	A11	2.4	16.8	36.9	22.7	5.8	84.6	9.6	5.8	---	---	---	---	---
S57-12-2	4-6	A12	2.8	15.6	34.3	20.6	10.5	83.8	9.8	6.4	---	---	---	---	---
S57-12-3	6-30	A21	2.2	14.8	34.2	28.4	5.4	85.0	7.9	7.1	---	---	---	---	---
S57-12-4	30-47	A22	2.4	14.7	32.8	25.1	10.5	85.5	7.8	6.7	---	---	---	---	---
S57-12-5	47-51	B1	4.2	15.8	29.3	22.5	10.3	82.1	5.9	12.0	---	---	---	---	---
S57-12-6	51-63	B2t	4.8	15.3	26.9	20.4	10.1	77.5	4.2	18.3	---	---	---	---	---
Dorovan:															
S57-15-1	0-1	Oa1	---	---	---	---	---	---	---	---	---	---	---	---	---
S57-15-2	1-15	Oa2	---	---	---	---	---	---	---	---	---	---	---	---	---
S57-15-3	15-55	Oa3	---	---	---	---	---	---	---	---	---	---	---	---	---
S57-15-4	55-63	Oa4	---	---	---	---	---	50.9	29.7	19.4	---	---	---	---	---
Dothan:															
S57-26-1	0-6	A1	0.3	2.6	11.9	35.9	23.4	74.1	15.5	10.4	---	---	---	---	---
S57-26-2	6-14	B1	0.3	2.6	11.0	34.4	22.7	71.0	13.9	15.1	---	---	---	---	---
S57-26-3	14-30	B21t	0.4	2.7	9.7	32.2	22.2	67.2	13.0	19.8	---	---	---	---	---
S57-26-4	30-43	B22t	0.2	2.0	9.2	29.1	17.7	58.2	8.8	33.0	---	---	---	---	---
S57-26-5	43-60	B23t	0.1	2.7	14.6	22.9	13.2	53.5	7.1	39.4	---	---	---	---	---

TABLE 19.--PHYSICAL PROPERTIES OF SELECTED SOILS--Continued

Soil series and sample numbers	Depth	Horizon	Particle size distribution (Percent less than 2 mm)								Hydraulic conductivity	Bulk density (field moisture)	Water content by weight		
			Sand						Silt (0.05-0.002)	Clay <0.002			1/10 bar	1/3 bar	15 bar
			Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Total (2.0-0.05)							
	In										cm/hr	g/cc	Pct		
Escambia:															
S57-23-1	0-7	A1	1.5	3.4	10.2	28.2	15.3	58.6	33.3	8.1	---	---	---	---	---
S57-23-2	7-10	A3	0.9	3.2	9.9	29.6	17.6	61.2	26.0	12.8	---	---	---	---	---
S57-23-3	10-14	B1	1.0	3.6	11.1	31.4	16.8	63.9	23.2	12.9	---	---	---	---	---
S57-23-4	14-19	B21t	1.6	4.4	14.1	31.4	13.9	65.4	19.2	15.4	---	---	---	---	---
S57-23-5	19-37	B22t	1.6	4.2	13.2	31.3	14.5	64.8	20.1	15.1	---	---	---	---	---
S57-23-6	37-65	B23t	1.4	5.4	31.5	31.5	15.5	68.5	17.7	13.8	---	---	---	---	---
Esto:															
S57-38-1	0-4	A1	0.8	2.0	3.5	18.6	19.6	44.5	36.6	18.9	2.7	1.28	25.4	19.2	12.3
S57-38-2	4-7	A2	1.5	2.5	3.5	18.0	20.3	45.8	34.1	20.1	0.7	1.35	24.3	19.5	15.4
S57-38-3	7-12	B1	0.4	1.1	2.8	16.4	17.8	38.5	30.5	31.0	0.3	1.51	24.2	20.7	16.4
S57-38-4	12-16	B21t	0.2	0.4	1.0	6.1	6.5	14.2	21.7	64.1	0.5	1.43	31.6	30.6	24.8
S57-38-5	16-24	B22t	0.1	0.3	0.9	3.4	4.3	9.0	16.6	64.4	0.0	1.34	37.7	35.0	28.7
S57-38-6	24-34	B23t	0.1	0.2	0.4	1.7	2.0	4.4	17.2	78.4	0.1	1.30	41.4	37.9	29.1
S57-38-7	34-49	B24t	0.1	0.1	0.2	0.9	1.1	2.4	14.1	83.5	0.2	1.29	41.9	39.7	30.4
S57-38-8	49-61	B24t	0.0	0.2	0.2	0.7	0.9	2.0	12.6	85.4	0.0	1.30	40.7	39.3	29.9
S57-38-9	61-78	Cg	0.0	0.1	0.2	0.4	0.7	1.4	31.5	67.1	0.2	1.25	45.2	42.0	30.8
Fuquay:															
S57-39-1	0-4	A11	0.4	7.8	23.3	32.3	13.9	77.7	17.1	5.2	15.9	1.39	15.4	11.0	4.3
S57-39-2	4-7	A12	0.6	9.9	24.6	31.6	12.7	79.4	14.1	6.5	17.7	1.45	12.5	9.1	3.8
S57-39-3	7-26	A2	0.4	9.0	24.5	33.1	12.3	79.3	12.5	8.2	14.8	1.55	12.5	9.6	4.1
S57-39-4	26-37	B1	0.9	9.9	21.2	30.4	13.1	75.5	12.5	12.0	4.4	1.72	13.6	9.4	5.4
S57-39-5	37-43	B21t	0.9	8.3	18.6	30.5	13.3	71.6	10.9	17.5	1.4	1.73	15.4	12.7	6.9
S57-39-6	43-59	B22t	0.8	5.5	14.9	30.6	12.7	64.5	8.3	27.2	1.9	1.76	15.5	12.8	8.4
S57-39-7	59-80	B3	1.0	9.5	21.0	31.5	11.0	74.0	9.0	17.0	---	---	---	---	---
Garcon:															
S57-42-1	0-4	A11	0.1	2.9	12.0	58.8	11.5	87.9	7.6	4.5	25.0	1.26	23.9	18.0	3.3
S57-42-2	4-8	A12	0.2	3.2	11.4	58.1	13.3	86.2	10.5	3.3	6.3	1.40	18.2	11.8	2.8
S57-42-3	8-20	A21	0.4	3.8	10.6	58.0	13.7	86.5	9.2	4.3	8.3	1.58	10.3	6.8	2.4
S57-42-4	20-31	A22	0.5	4.2	12.3	56.6	12.6	86.2	6.6	7.2	5.9	1.66	12.2	8.2	3.0
S57-42-5	31-39	B21t	0.4	4.5	13.7	53.0	9.9	81.5	5.1	13.4	0.0	1.63	20.3	18.0	6.9
S57-42-6	39-51	B22t	0.4	3.9	14.1	55.8	8.8	83.0	3.6	13.4	2.0	1.62	17.1	11.4	7.3
S57-42-7	51-58	B3	0.1	1.0	9.0	67.4	11.1	88.6	3.0	8.4	---	---	---	---	---
S57-42-8	58-69	C1	0.0	0.5	11.0	69.1	10.0	90.6	2.4	7.0	---	---	---	---	---
S57-42-9	69-80	C2	0.0	0.0	2.3	89.3	3.7	95.3	0.5	4.2	---	---	---	---	---
Kalmia:															
S57-36-1	0-5	A11	0.1	0.4	1.9	39.5	31.7	73.6	20.9	5.5	10.2	1.23	21.4	14.8	6.5
S57-36-2	5-10	A12	0.0	0.3	1.6	40.0	33.9	75.8	18.5	5.7	1.8	1.55	16.6	10.7	4.8
S57-36-3	10-17	A2	0.0	0.3	1.6	41.7	33.1	76.7	16.7	6.6	3.4	1.61	15.1	9.3	4.1
S57-36-4	17-31	B2t	0.0	0.0	0.5	34.6	30.2	65.3	4.2	30.5	2.1	1.50	23.0	19.1	11.1
S57-36-5	31-42	B3	0.0	0.0	0.2	39.8	35.3	75.3	12.0	12.7	3.0	1.53	19.5	13.5	6.9
S57-36-6	42-49	IIC1	0.0	0.0	0.2	43.3	35.4	78.9	12.3	8.8	2.6	1.55	19.6	12.7	5.6
S57-36-7	49-60	IIC2	0.0	0.0	0.2	45.2	35.9	81.3	11.2	7.5	3.5	1.54	18.7	11.0	4.7
S57-36-8	60-90	IIC3	0.0	0.0	0.1	27.7	43.2	71.0	17.5	11.5	---	---	---	---	---
S57-36-9	90-96	IIC4	0.0	0.3	3.3	63.5	22.8	89.9	6.8	3.3	---	---	---	---	---

TABLE 19.--PHYSICAL PROPERTIES OF SELECTED SOILS--Continued

Soil series and sample numbers	Depth	Horizon	Particle size distribution (Percent less than 2 mm)								Hydraulic conductivity	Bulk density (field moisture)	Water content by weight		
			Sand						Silt (0.05-0.002)	Clay <0.002			1/10 bar	1/3 bar	15 bar
			Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Total (2.0-0.05)							
	In										cm/hr	g/cc	Pct		
Kureb:															
S57-47-1	0-3	A1	0.1	4.0	73.1	17.8	0.2	95.2	4.2	0.6	---	---	---	---	---
S57-47-2	3-16	A2	0.0	5.0	75.6	17.3	0.0	97.9	1.8	0.3	218.0	1.30	4.2	3.2	0.4
S57-47-3	16-24	C&Bh	0.0	3.5	70.2	19.8	0.2	93.7	3.3	3.0	143.0	1.45	6.0	4.8	2.2
S57-47-4	24-39	C1	0.0	4.0	72.4	18.6	0.1	95.1	3.0	1.9	292.0	1.31	6.6	5.5	1.6
S57-47-5	39-55	C2	0.0	3.6	71.8	20.3	0.1	95.8	3.4	0.8	125.0	1.48	3.8	2.7	0.9
S57-47-6	55-80	C3	0.0	4.3	74.2	19.2	0.1	97.8	1.4	0.8	106.0	1.49	3.8	2.7	0.6
Lakeland:															
S57-9-1	0-4	A1	1.1	17.1	44.1	9.2	17.3	88.8	7.8	3.4	---	---	---	---	---
S57-9-2	4-8	C1	1.9	19.7	42.1	19.1	6.7	89.5	6.6	3.9	---	---	---	---	---
S57-9-3	8-32	C2	1.8	16.1	41.1	24.9	5.1	89.3	6.1	4.6	---	---	---	---	---
S57-9-4	32-62	C3	2.4	18.7	39.8	23.8	7.2	91.9	4.5	3.6	---	---	---	---	---
S57-9-5	62-83	C4	2.1	17.8	41.1	25.7	7.4	94.1	3.3	2.6	---	---	---	---	---
Leon:															
S57-46-1	0-2	A1	0.1	6.7	68.3	16.2	0.8	94.9	3.1	2.0	---	---	---	---	---
S57-46-2	2-16	A2	0.0	5.8	72.2	17.8	0.1	95.9	3.5	0.6	79.5	1.52	5.3	3.7	1.0
S57-46-3	16-21	B21h	0.0	4.9	63.9	17.8	0.2	86.8	7.9	5.3	39.4	1.34	28.4	21.3	5.0
S57-46-4	21-25	B22h	0.0	5.5	66.3	17.3	0.2	89.3	5.9	4.8	43.4	1.47	14.5	11.2	3.8
S57-46-5	25-32	B3	0.0	5.0	65.6	20.8	0.2	91.6	5.2	3.2	21.7	1.61	9.3	6.9	2.5
S57-46-6	32-44	C1	0.0	5.0	68.7	22.3	0.2	96.2	2.7	1.2	73.6	1.57	3.9	2.6	0.6
Lucy:															
S57-27-1	0-10	Ap	0.8	14.9	33.6	25.7	5.4	80.5	11.6	7.9	6.1	1.70	11.1	9.3	4.5
S57-27-2	10-18	A2	1.1	16.4	33.7	23.2	4.7	79.1	11.2	9.7	9.6	1.70	13.6	8.8	3.7
S57-27-3	18-26	A3	1.5	16.3	32.7	24.4	5.9	80.9	10.0	9.1	14.7	1.69	9.4	7.1	3.7
S57-27-4	26-34	B1	4.7	18.5	30.0	21.6	4.9	79.8	9.6	10.6	27.6	1.51	10.4	9.0	5.2
S57-27-5	34-41	B21t	1.8	15.9	29.2	23.7	5.8	76.5	7.4	16.1	14.4	1.61	12.7	11.1	6.7
S57-27-6	41-60	B22t	2.1	17.7	29.5	18.8	4.3	72.5	3.9	23.6	2.7	1.66	14.8	13.6	8.8
S57-27-7	60-80	B22t	1.8	17.0	31.1	22.5	5.3	77.8	4.2	18.0	8.9	1.68	11.6	10.4	6.7
Lynchburg:															
S57-28-1	0-4	A1	0.1	0.2	0.7	22.3	29.2	52.5	36.5	11.0	3.8	1.27	28.5	20.7	5.9
S57-28-2	4-9	A2	0.1	0.1	0.4	20.9	28.8	50.9	32.3	16.8	1.1	1.36	23.8	17.5	7.1
S57-28-3	9-17	B1	0.1	0.1	0.4	19.7	27.6	48.4	31.7	19.9	0.2	1.60	21.5	18.1	9.3
S57-28-4	17-25	B21t	0.0	0.1	0.4	20.3	25.7	47.0	31.2	21.8	0.1	1.64	21.9	19.0	9.7
S57-28-5	25-44	B22t	0.1	0.1	0.3	19.1	25.0	45.1	27.5	27.4	0.0	1.63	24.5	22.6	13.0
S57-28-6	44-60	B23t	0.0	0.0	0.2	17.4	26.7	45.3	25.5	29.2	0.0	1.68	22.4	21.5	15.1
S57-28-7	60-80	B24t	0.0	0.0	0.2	16.3	24.8	42.5	25.7	31.8	0.0	1.72	21.0	20.7	12.4
Maxton:															
S57-31-1	0-6	A1	0.5	4.7	7.0	27.1	37.1	78.2	17.4	4.4	2.0	1.28	21.1	13.3	13.6
S57-31-2	6-10	A2	0.4	4.6	7.1	28.6	35.5	77.5	16.3	6.2	0.9	1.52	16.7	10.2	3.9
S57-31-3	10-14	B11	0.4	4.4	7.0	27.5	35.3	76.1	15.9	8.0	0.6	1.62	15.8	10.9	5.1
S57-31-4	14-19	B12	0.5	3.9	6.3	24.5	32.4	68.9	16.5	14.6	0.6	1.55	18.1	14.0	8.3
S57-31-5	19-32	B2t	0.3	2.9	4.5	19.7	29.3	58.0	16.0	26.0	0.1	1.58	20.9	17.7	10.8
S57-31-6	32-38	B3	0.2	4.5	6.2	28.3	29.6	70.0	13.8	16.2	1.7	1.53	15.6	12.5	7.9
S57-31-7	38-59	IIC1	1.4	15.3	19.0	30.8	21.8	88.9	6.7	4.4	35.2	1.50	6.5	3.2	1.8
S57-31-8	59-72	IIC2	0.5	10.2	31.6	50.7	4.2	97.2	1.4	1.4	29.7	1.54	6.2	3.2	1.1

TABLE 19.--PHYSICAL PROPERTIES OF SELECTED SOILS--Continued

Soil series and sample numbers	Depth	Horizon	Particle size distribution (Percent less than 2 mm)								Hydraulic conductivity	Bulk density (field moisture)	Water content by weight		
			Sand						Silt (0.05-0.002)	Clay <0.002			1/10 bar	1/3 bar	15 bar
			Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Total (2.0-0.05)							
	In										cm/hr	g/cc	Pct		
Mulat:															
S57-41-1	0-4	A11	0.3	3.9	10.7	54.9	9.5	82.5	15.2	2.3	20.2	1.08	29.7	22.2	6.3
S57-41-2	4-10	A12	0.5	6.2	16.6	56.2	7.1	86.6	9.6	3.8	16.7	1.37	12.5	7.9	2.3
S57-41-3	10-17	A21	0.8	7.2	19.4	54.1	6.8	88.3	8.1	3.6	11.3	1.55	9.6	6.3	2.4
S57-41-4	17-27	A22	1.2	11.2	29.2	46.2	3.9	91.7	5.4	2.9	8.9	1.62	9.0	6.3	1.5
S57-41-5	27-34	B21tg	1.1	8.3	22.2	41.8	4.3	77.7	5.7	16.6	1.1	1.48	27.8	25.9	9.7
S57-41-6	34-49	B22tg	1.0	9.8	22.0	41.1	4.0	77.9	3.8	18.3	8.8	1.58	20.8	20.0	7.9
S57-41-7	49-57	C1g	1.1	10.3	27.6	48.4	4.7	92.1	1.0	6.9	2.6	1.70	12.0	7.3	3.4
S57-41-8	57-71	C2g	1.5	11.8	31.7	46.3	3.8	95.1	0.9	4.0	2.0	1.69	15.8	8.2	1.8
S57-41-9	71-80	C3g	1.1	9.6	30.1	50.7	4.0	95.5	1.0	3.5	0.6	1.69	13.4	7.5	1.3
Orangeburg:															
S57-13-1t	0-8	Ap	0.6	8.9	27.3	23.4	17.3	77.5	13.7	8.8	---	---	---	---	---
S57-13-2	8-14	B1	0.9	7.9	23.3	25.3	12.2	69.6	13.6	16.8	---	---	---	---	---
S57-13-3	14-25	B21t	1.2	7.9	20.5	21.4	12.5	63.5	12.6	23.9	---	---	---	---	---
S57-13-4	25-47	B22t	1.0	7.8	20.5	23.2	4.4	56.9	8.6	34.5	---	---	---	---	---
S57-13-5	47-73	B23t	0.4	8.8	23.8	25.7	3.1	61.8	8.1	30.1	---	---	---	---	---
Pactolus:															
S57-22-1	0-5	A11	0.3	8.1	35.4	33.3	5.5	82.6	12.3	5.1	---	---	---	---	---
S57-22-2	5-8	A12	0.2	6.5	32.1	37.9	8.7	85.4	11.4	3.2	---	---	---	---	---
S57-22-3	8-17	C1	0.2	6.4	31.3	39.0	10.0	86.9	10.6	2.5	---	---	---	---	---
S57-22-4	17-30	C2	0.4	9.8	36.1	34.7	6.6	87.6	8.3	4.1	---	---	---	---	---
S57-22-5	30-52	C3	0.6	8.2	31.7	41.1	8.9	90.5	5.7	3.8	---	---	---	---	---
S57-22-6	52-80	C4	0.7	8.2	33.7	43.6	10.2	96.4	2.5	1.1	---	---	---	---	---
Red Bay:															
S57-24-1	0-8	Ap	0.7	7.8	22.1	27.9	10.9	69.4	15.5	15.1	---	---	---	---	---
S57-24-2	8-14	B1	0.6	6.8	21.5	27.6	10.2	66.7	12.9	20.4	---	---	---	---	---
S57-24-3	14-51	B21t	0.6	6.6	18.8	27.7	10.5	64.2	11.3	24.5	---	---	---	---	---
S57-24-4	51-80	B22t	0.9	7.9	21.3	30.8	11.6	72.5	7.1	20.4	---	---	---	---	---
Rutlege:															
S57-40-1	0-12	A11	0.5	11.0	62.6	10.4	1.3	85.8	11.6	2.6	8.0	1.48	17.6	12.6	3.9
S57-40-2	12-21	A12	0.4	9.5	66.6	8.0	1.1	85.6	9.2	5.2	13.6	1.56	9.8	7.7	3.2
S57-40-3	21-61	Cg	1.3	16.2	68.0	6.5	1.0	93.0	3.9	3.1	---	---	---	---	---
Tifton:															
S57-33-1	0-8	Apcn	0.3	7.1	25.5	27.1	8.8	68.8	14.9	16.3	4.9	1.61	14.0	11.3	6.5
S57-33-2	8-19	B21tcn	0.3	6.6	19.5	21.4	9.5	57.4	13.4	29.2	4.6	1.62	17.9	16.1	10.0
S57-33-3	19-30	B21tcn	0.4	6.8	19.9	21.1	9.1	57.4	11.2	31.4	5.7	1.53	19.6	17.9	11.0
S57-33-4	30-42	B22tcn	0.3	6.8	22.0	20.9	8.6	58.8	8.8	32.4	1.6	1.60	20.3	18.4	11.8
S57-33-5	42-58	B23tcn	0.4	6.9	22.1	17.8	8.2	55.5	10.7	33.8	3.3	1.65	20.0	18.9	13.9
S57-33-6	58-70	B24t	0.2	3.0	10.7	16.1	14.9	44.9	15.0	40.1	0.1	1.60	24.9	23.6	19.3
Troup:															
S57-10-1	0-3	A1	1.2	15.3	39.4	24.1	5.8	85.8	9.3	4.9	---	---	---	---	---
S57-10-2	3-21	A21	1.7	15.5	39.3	25.2	4.6	86.3	7.3	6.4	---	---	---	---	---
S57-10-3	21-39	A22	1.7	14.7	38.1	27.5	5.2	87.2	6.7	6.1	---	---	---	---	---
S57-10-4	39-55	A23	2.7	16.0	37.8	24.5	8.3	89.3	4.5	6.2	---	---	---	---	---
S57-10-5	55-60	B21t	2.7	18.3	34.1	20.7	5.5	81.3	3.3	15.4	---	---	---	---	---
S57-10-6	60-80	B22t	2.8	17.2	33.2	22.0	3.5	78.7	1.7	19.6	---	---	---	---	---

TABLE 20.--CHEMICAL PROPERTIES OF SELECTED SOILS

[Tr means trace, indicating less than 0.05 meq/100 g. Absence of an entry indicates that the test was not performed]

Soil series and sample number	Depth	Horizon	Extractable bases					Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	Reaction			Dithionite-citrate extract	
			Ca	Mg	Na	K	Sum						H_2O	$CaCl_2$	KCl	Al	Fe
	In		meq/100 grams							Pct	Pct	mmho/cm	pH	pH	pH	Pct	Pct
Albany:																	
S57-37-1	0-5	A1	0.13	0.07	0.02	0.05	0.27	11.50	11.77	2	2.05	0.06	5.0	4.3	4.1	0.125	0.222
S57-37-2	5-17	A21	0.04	0.02	0.00	0.01	0.07	2.40	2.47	3	0.22	0.03	5.5	4.9	4.6	0.070	0.094
S57-37-3	17-25	A22	0.09	0.06	0.00	0.01	0.15	1.50	1.66	10	0.08	0.02	5.6	5.0	4.5	0.080	0.184
S57-37-4	25-47	A23	0.06	0.08	0.00	0.01	0.15	1.90	2.05	7	0.03	0.02	5.6	4.8	4.5	0.130	0.562
S57-37-5	47-52	B1	0.04	0.13	0.01	0.01	0.19	2.70	2.89	7	0.05	0.02	5.6	4.8	4.5	0.200	0.817
S57-37-6	52-67	B21t	0.04	0.17	0.01	0.01	0.23	3.80	4.03	6	0.09	0.02	5.6	4.7	4.5	0.325	1.725
S57-37-7	67-80	B22t	0.02	0.12	0.00	0.00	0.14	3.20	3.34	4	0.05	0.02	5.6	4.7	4.5	0.250	0.980
Angie Variant:																	
S57-30-1	0-4	A1	1.30	0.60	0.10	0.20	2.20	29.30	31.50	7	4.45	0.11	4.3	3.7	3.4	---	---
S57-30-2	4-7	B1	0.30	0.20	0.10	tr	0.60	14.70	15.30	4	0.95	0.04	4.9	4.0	3.8	0.240	0.510
S57-30-3	7-11	B21t	0.50	0.70	0.10	0.10	1.40	16.30	17.70	8	0.74	0.02	5.0	3.9	3.6	0.420	1.530
S57-30-4	11-25	B22t	0.30	1.10	0.10	0.10	1.60	20.00	21.60	7	0.29	0.02	4.9	3.7	3.4	0.460	1.790
S57-30-5	25-39	B23t	0.10	0.80	tr	0.10	1.00	13.60	14.60	7	0.12	0.02	5.2	3.7	3.4	0.220	1.010
S57-30-6	39-52	B24tg	0.10	1.40	0.10	0.10	1.70	23.20	24.90	7	0.15	0.02	4.9	3.7	3.3	0.320	1.640
S57-30-7	52-76	B25tg	0.10	1.50	0.10	0.10	1.80	22.40	24.20	7	0.13	0.02	4.9	3.6	3.2	0.290	1.430
Bohicket:																	
S57-45-1	0-15	A1g	11.72	24.27	27.71	0.96	64.66	64.95	129.61	50	14.35	47.00	2.7	2.8	2.5	---	---
S57-45-2	15-45	C1g	6.85	15.67	20.73	1.14	44.39	34.22	78.61	56	7.08	37.50	3.2	3.3	2.9	---	---
S57-45-3	45-80	IIC2g	1.31	3.28	5.02	0.17	9.78	5.64	15.42	63	0.80	9.00	3.1	3.2	2.9	---	---
Bonifay:																	
S57-12-1	0-4	A11	0.88	0.22	tr	0.06	1.20	9.15	10.35	12	1.51	---	5.4	4.2	4.0	0.130	0.230
S57-12-2	4-6	A12	0.41	0.12	tr	tr	0.50	6.13	6.63	8	1.01	---	5.6	4.3	4.1	0.150	0.230
S57-12-3	6-30	A21	0.14	tr	tr	tr	0.10	2.54	2.64	4	0.15	---	5.3	4.1	4.1	0.150	0.280
S57-12-4	30-47	A22	0.17	0.07	tr	tr	0.20	2.46	2.66	8	0.13	---	5.5	4.2	4.2	0.150	0.270
S57-12-5	47-51	B1	0.23	0.09	tr	tr	0.30	2.82	3.12	10	0.10	---	5.5	4.3	4.4	0.250	0.770
S57-12-6	51-63	B2t	0.13	0.14	tr	tr	0.30	4.10	4.40	7	---	---	5.5	4.4	4.5	0.300	1.360
Dorovan:																	
S57-15-1	0-1	Oa1	7.50	3.60	0.30	0.60	12.00	145.50	157.50	8	46.20	---	4.4	4.1	3.6	---	---
S57-15-2	1-15	Oa2	1.40	1.80	0.30	0.30	3.80	103.00	106.80	4	44.70	---	4.4	3.4	3.1	---	---
S57-15-3	15-55	Oa3	1.00	2.60	0.30	tr	3.90	235.00	238.90	2	48.50	---	3.8	3.2	2.8	---	---
S57-15-4	55-63	Oa4	0.60	0.60	0.20	tr	1.40	---	---	---	29.90	---	4.8	3.4	3.1	---	---
Dothan:																	
S57-26-1	0-6	A1	0.50	0.20	tr	tr	0.70	12.50	13.20	5	1.43	0.15	4.3	4.1	3.5	0.175	0.375
S57-26-2	6-14	B1	0.10	0.10	tr	tr	0.20	6.80	7.00	3	0.31	0.03	4.6	4.1	3.6	0.200	0.683
S57-26-3	14-30	B21t	0.20	0.20	tr	tr	0.40	6.10	6.50	6	0.19	0.02	4.8	4.0	3.7	0.262	0.019
S57-26-4	30-43	B22t	0.10	0.10	tr	tr	0.20	11.10	11.30	2	0.13	0.02	4.9	4.0	3.6	0.406	1.781
S57-26-5	43-60	B23t	tr	0.10	tr	tr	0.10	9.40	9.50	1	0.11	0.02	4.9	3.9	3.5	0.418	2.156

TABLE 20.--CHEMICAL PROPERTIES OF SELECTED SOILS--Continued

Soil series and sample number	Depth	Horizon	Extractable bases					Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	Reaction			Dithionite-citrate extract	
			Ca	Mg	Na	K	Sum						H_2O	$CaCl_2$	KCl	Al	Fe
	In		meq/100 grams							Pct	Pct	mmho/cm	pH	pH	pH	Pct	Pct
Escambia:																	
S57-23-1	0-7	A1	0.10	0.10	tr	tr	0.20	18.00	18.20	1	3.06	0.06	4.9	4.2	4.0	0.259	0.414
S57-23-2	7-10	A3	0.10	tr	tr	tr	0.10	11.80	11.10	1	1.06	0.04	4.8	4.3	4.1	0.202	0.426
S57-23-3	10-14	B1	tr	tr	tr	tr	tr	5.00	5.00	0	0.37	0.02	4.7	4.3	4.1	0.169	0.414
S57-23-4	14-19	B21t	0.10	0.10	tr	tr	0.20	5.00	5.20	4	0.23	0.02	4.8	4.3	4.1	0.219	0.758
S57-23-5	19-37	B22t	0.10	0.10	tr	tr	0.20	6.00	6.20	3	0.16	0.02	4.9	4.3	4.0	0.287	1.071
S57-23-6	37-65	B23t	0.10	0.10	tr	tr	0.20	4.20	4.40	5	0.57	0.02	4.9	4.2	4.0	0.237	0.987
Esto:																	
S57-38-1	0-4	A1	0.18	0.10	0.02	0.11	0.41	20.40	20.81	2	3.12	0.06	4.7	4.2	3.9	0.285	0.980
S57-38-2	4-7	A2	0.08	0.08	0.02	0.08	0.26	13.30	13.55	2	1.62	0.04	4.9	4.4	4.1	0.285	1.210
S57-38-3	7-12	B1	0.02	0.14	0.03	0.05	0.24	9.50	9.74	2	0.88	0.03	5.0	4.4	4.1	0.370	1.500
S57-38-4	12-16	B21t	0.07	0.40	0.05	0.07	0.59	14.50	15.09	4	0.56	0.02	5.3	4.4	4.0	0.610	2.680
S57-38-5	16-24	B22t	0.07	0.64	0.08	0.12	0.91	19.50	20.41	4	0.34	0.02	5.4	4.3	3.9	0.490	1.900
S57-38-6	24-34	B23t	0.01	0.74	0.09	0.17	0.01	24.00	25.01	4	0.24	0.03	5.3	4.4	3.8	0.440	1.680
S57-38-7	34-49	B24t	0.03	1.02	0.09	0.23	1.37	28.40	29.77	5	0.42	0.03	5.3	4.3	3.7	0.345	1.525
S57-38-8	49-61	B24t	0.09	1.37	0.10	0.30	1.86	31.00	32.86	6	0.15	0.04	5.2	4.2	3.7	0.345	1.700
S57-38-9	61-78	Cg	0.10	2.12	0.10	0.45	2.77	33.30	36.07	8	0.14	0.06	5.1	4.1	3.6	0.335	1.475
Fuquay:																	
S57-39-1	0-4	A11	0.44	0.16	0.04	0.05	0.69	9.20	9.89	7	1.72	0.06	5.2	4.6	4.2	0.140	0.290
S57-39-2	4-7	A12	0.21	0.08	0.02	0.03	0.34	4.90	5.24	10	0.76	0.04	5.6	4.9	4.4	0.150	0.322
S57-39-3	7-26	A2	0.10	0.10	0.02	0.01	0.23	3.20	3.43	7	0.36	0.04	5.6	5.0	4.4	0.145	0.370
S57-39-4	26-37	B1	0.10	0.14	0.06	0.02	0.32	3.00	3.32	10	0.15	0.07	5.4	4.8	4.4	0.180	0.618
S57-39-5	37-43	B21t	0.04	0.17	0.02	0.01	0.24	3.70	3.94	6	0.16	0.01	5.6	4.8	4.4	0.240	0.930
S57-39-6	43-59	B22t	0.10	0.32	0.02	0.02	0.46	5.00	5.46	8	0.08	0.02	5.5	4.6	4.3	0.305	1.750
S57-39-7	59-80	B3	0.02	0.15	0.01	0.01	0.19	3.40	3.59	5	0.08	0.01	5.6	4.7	4.4	0.225	0.940
Garcon:																	
S57-42-1	0-4	A11	0.08	0.05	0.03	0.04	0.20	8.65	8.85	2	1.49	0.08	4.8	4.4	3.9	---	---
S57-42-2	4-8	A12	0.06	0.03	0.04	0.02	0.15	4.81	4.96	3	0.81	0.05	5.1	4.7	4.2	---	---
S57-42-3	8-20	A21	0.03	0.02	0.02	0.01	0.08	1.72	1.80	4	0.13	0.03	5.2	4.6	4.4	---	---
S57-42-4	20-31	A22	0.03	0.05	0.01	0.01	0.10	1.92	2.02	5	0.04	0.02	5.3	4.4	4.2	---	---
S57-42-5	31-39	B21t	0.03	0.11	0.02	0.01	0.17	3.64	3.81	4	0.05	0.02	5.2	4.2	4.0	0.180	0.720
S57-42-6	39-51	B22t	0.02	0.12	0.02	0.02	0.18	3.19	3.37	5	0.04	0.02	5.1	4.2	3.9	0.120	0.370
S57-42-7	51-58	B3	0.09	0.09	0.06	0.01	0.25	2.06	2.31	11	0.01	0.08	4.8	4.2	4.0	---	---
S57-42-8	58-69	C1	0.07	0.07	0.02	0.02	0.18	1.38	1.56	12	0.01	0.02	5.1	4.2	4.0	---	---
S57-42-9	69-80	C2	0.05	0.05	0.04	0.01	0.15	0.62	0.77	19	0.02	0.04	4.9	4.3	4.1	---	---
Kalmia:																	
S57-36-1	0-5	A11	0.66	0.19	0.03	0.09	0.97	9.20	10.17	10	1.99	0.07	5.5	4.8	4.3	0.140	0.245
S57-36-2	5-10	A12	0.19	0.07	0.01	0.03	0.30	6.60	6.90	4	1.02	0.04	5.5	4.9	4.4	0.145	0.243
S57-36-3	10-17	A2	0.12	0.07	0.01	0.02	0.22	4.10	4.32	5	0.41	0.04	5.6	4.8	4.4	0.130	0.258
S57-36-4	17-31	B2t	0.08	0.54	0.02	0.05	0.69	8.90	9.59	7	0.18	0.03	5.3	4.4	4.0	0.295	1.140
S57-36-5	31-42	B3	0.04	0.33	0.01	0.03	0.41	5.90	6.31	6	0.09	0.02	5.5	4.4	4.0	0.195	0.860
S57-36-6	42-49	IIC1	0.04	0.22	0.00	0.03	0.29	4.60	4.89	6	0.08	0.03	5.5	4.5	4.1	0.130	0.547
S57-36-7	49-60	IIC2	0.06	0.19	0.01	0.02	0.28	4.00	4.28	7	0.06	0.02	5.6	4.5	4.2	0.085	0.384
S57-36-8	60-90	IIC3	0.04	0.29	0.01	0.04	0.38	5.60	5.98	6	0.06	0.02	5.5	4.6	4.1	0.150	0.748
S57-36-9	90-96	IIC4	0.02	0.11	0.00	0.01	0.14	2.20	2.34	6	0.04	0.01	5.6	4.5	4.2	0.040	0.114

TABLE 20.--CHEMICAL PROPERTIES OF SELECTED SOILS--Continued

Soil series and sample number	Depth	Horizon	Extractable bases					Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	Reaction			Dithionite-citrate extract	
			Ca	Mg	Na	K	Sum						H_2O	$CaCl_2$	KCl	Al	Fe
	In		meq/100 grams							Pct	Pct	mmho/cm	pH	pH	pH	Pct	Pct
Kureb:*																	
S57-47-1	0-3	A1	1.39	0.19	0.02	0.05	1.65	4.41	6.06	27	1.45	0.08	4.8	3.9	3.7	---	---
S57-47-2	3-16	A2	0.07	0.01	0.01	0.00	0.09	0.49	0.58	16	0.13	0.03	5.5	5.2	4.2	---	---
S57-47-3	16-24	C&Bh	0.07	0.05	0.05	0.01	0.18	2.81	2.99	6	0.30	0.09	5.1	4.4	4.1	0.130	0.250
S57-47-4	24-39	C1	0.04	0.02	0.00	0.01	0.07	1.44	1.51	5	0.10	0.02	5.4	4.8	4.4	---	---
S57-47-5	39-55	C2	0.03	0.03	0.02	0.01	0.09	0.97	1.06	8	0.05	0.06	5.5	5.0	4.5	---	---
S57-47-6	55-80	C3	0.05	0.01	0.01	0.00	0.07	0.56	0.63	11	0.06	0.04	6.0	5.5	4.9	---	---
Lakeland:																	
S57-9-1	0-4	A1	0.40	0.10	tr	tr	0.50	4.20	4.70	11	0.80	---	4.8	4.2	4.0	---	---
S57-9-2	4-8	C1	0.30	0.10	tr	tr	0.40	3.00	3.40	12	0.19	---	4.9	4.2	4.2	---	---
S57-9-3	8-32	C2	0.10	0.10	tr	tr	0.20	2.00	2.20	9	---	---	4.8	4.2	4.2	---	---
S57-9-4	32-62	C3	0.10	tr	tr	tr	0.10	1.20	1.30	8	---	---	4.9	4.3	4.2	---	---
S57-9-5	62-83	C4	0.10	tr	tr	tr	0.10	0.80	0.90	11	---	---	5.0	4.3	4.3	---	---
Leon:*																	
S57-46-1	0-2	A1	0.05	0.14	0.09	0.03	0.31	8.29	8.60	4	1.95	0.13	3.8	3.1	2.6	---	---
S57-46-2	2-16	A2	0.05	0.03	0.01	0.00	0.09	1.55	1.64	5	0.31	0.03	4.6	3.0	3.4	---	---
S57-46-3	16-21	B21h	0.03	0.04	0.03	0.01	0.11	10.85	10.96	1	1.66	0.07	4.4	3.8	3.7	0.150	0.040
S57-46-4	21-25	B22h	0.03	0.02	0.02	0.00	0.07	9.96	10.03	1	1.70	0.03	4.8	4.3	4.1	0.240	0.050
S57-46-5	25-32	B3	0.03	0.02	0.02	0.00	0.07	3.69	3.76	2	0.36	0.04	4.9	4.4	4.2	---	---
S57-46-6	32-44	C1	0.02	0.01	0.00	0.00	0.03	0.97	1.00	3	0.14	0.03	4.8	4.4	4.3	---	---
Lucy:																	
S57-27-1	0-10	Ap	1.70	0.50	tr	0.10	2.30	6.00	8.30	28	1.02	0.07	5.6	4.8	4.5	---	---
S57-27-2	10-18	A2	0.20	0.20	tr	0.10	0.50	4.10	4.60	11	0.33	0.06	5.3	4.7	4.3	---	---
S57-27-3	18-26	A3	0.20	0.20	tr	0.10	0.50	3.10	3.60	14	0.20	0.06	5.2	4.8	4.2	---	---
S57-27-4	26-34	B1	0.30	0.20	tr	0.10	0.60	3.20	3.80	16	0.15	0.05	5.2	4.7	4.2	0.150	0.600
S57-27-5	34-41	B21t	0.40	0.30	tr	0.10	0.80	4.20	5.00	16	0.15	0.04	5.1	4.5	4.1	0.130	0.660
S57-27-6	41-60	B22t	0.50	0.20	tr	tr	0.70	4.70	5.40	13	0.18	0.06	5.1	4.4	4.4	0.170	1.150
S57-27-7	60-80	B22t	0.10	0.10	tr	tr	0.20	3.30	3.50	6	0.18	0.06	4.7	4.4	4.4	0.120	0.950
Lynchburg:																	
S57-28-1	0-4	A1	0.10	0.10	tr	tr	0.20	19.20	19.40	1	3.28	0.08	4.5	3.8	3.7	---	---
S57-28-2	4-9	A2	0.10	tr	tr	tr	0.10	9.80	9.90	1	0.83	0.05	4.6	4.0	3.8	---	---
S57-28-3	9-17	B1	0.10	0.10	tr	tr	0.20	8.20	8.40	2	0.36	0.04	4.7	3.9	3.7	0.180	0.470
S57-28-4	17-25	B21t	0.10	0.10	tr	tr	0.20	6.70	6.90	3	0.29	0.03	4.7	3.9	3.6	0.180	0.640
S57-28-5	25-44	B22t	0.10	0.20	tr	tr	0.30	8.20	8.50	4	0.17	0.02	4.9	3.8	3.5	0.190	0.860
S57-28-6	44-60	B23t	0.20	0.30	tr	tr	0.50	11.00	11.50	4	0.32	0.02	4.9	3.7	3.5	0.240	1.880
S57-28-7	60-80	B24t	0.40	0.80	tr	0.10	1.30	12.00	13.30	10	0.14	0.02	5.0	3.7	3.4	0.170	1.290
Maxton:																	
S57-31-1	0-6	A1	0.60	0.20	tr	0.10	0.90	6.90	7.80	12	1.48	0.04	4.9	4.2	3.8	---	---
S57-31-2	6-10	A2	0.40	0.10	0.10	tr	0.60	4.60	5.20	12	1.20	0.10	4.9	4.3	4.0	---	---
S57-31-3	10-14	B11	0.20	0.10	tr	tr	0.30	5.10	5.40	6	0.50	0.04	5.0	4.2	3.9	---	---
S57-31-4	14-19	B12	0.40	0.30	tr	tr	0.70	6.40	7.10	10	0.48	0.03	5.0	4.1	3.8	0.220	0.760
S57-31-5	19-32	B2t	0.80	0.30	tr	tr	1.10	9.20	10.30	11	0.28	0.02	5.1	4.0	3.7	0.330	1.570
S57-31-6	32-38	B3	0.20	0.10	tr	tr	0.30	6.40	6.70	4	0.15	0.02	5.2	4.0	3.7	0.140	0.510
S57-31-7	38-59	IIC1	0.10	0.10	tr	tr	0.20	2.30	2.50	8	0.20	0.01	5.4	4.1	3.9	---	---
S57-31-8	59-72	IIC2	tr	tr	tr	tr	tr	0.50	0.50	---	0.07	0.02	5.1	4.3	4.1	---	---

TABLE 20.--CHEMICAL PROPERTIES OF SELECTED SOILS--Continued

Soil series and sample number	Depth	Horizon	Extractable bases					Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	Reaction			Dithionite-citrate extract	
			Ca	Mg	Na	K	Sum						H_2O	$CaCl_2$	KCl	Al	Fe
	In		meq/100 grams							Pct	Pct	mmho/cm	pH	pH	pH	Pct	Pct
Mulat:																	
S57-41-1	0-4	A11	0.10	0.07	0.05	0.04	0.26	13.39	13.65	2	1.97	0.12	5.3	4.0	3.8	---	---
S57-41-2	4-10	A12	0.03	0.02	0.00	0.01	0.06	3.71	3.77	2	0.54	0.03	4.7	4.3	4.1	---	---
S57-41-3	10-17	A21	0.03	0.02	0.00	0.00	0.06	1.51	1.57	4	0.20	0.02	4.9	4.4	4.2	---	---
S57-41-4	17-27	A22	0.04	0.04	0.00	0.00	0.08	0.34	0.42	19	0.08	0.03	5.2	4.5	4.2	---	---
S57-41-5	27-34	B21tg	0.05	0.21	0.06	0.03	0.35	5.77	6.12	6	0.13	0.03	4.9	3.8	3.5	0.130	0.810
S57-41-6	34-49	B22tg	0.04	0.25	0.05	0.04	0.38	7.10	7.48	5	0.07	0.03	5.3	4.0	3.6	0.140	0.600
S57-41-7	49-57	C1g	0.02	0.09	0.03	0.02	0.16	1.55	1.71	9	0.03	0.03	5.0	3.9	3.6	---	---
S57-41-8	57-71	C2g	0.03	0.07	0.01	0.01	0.12	0.83	0.95	13	0.01	0.03	5.0	4.0	3.7	---	---
S57-41-9	71-80	C3g	0.06	0.07	0.03	0.01	0.17	1.86	2.03	8	0.16	0.85	3.1	3.3	3.0	---	---
Orange-burg:																	
S57-13-1	0-8	Ap	1.30	0.20	tr	0.20	1.70	7.20	9.90	17	0.87	---	4.9	4.3	4.0	0.160	0.390
S57-13-2	8-14	B1	1.30	0.50	tr	0.10	1.90	4.00	5.90	32	0.25	---	6.1	5.5	5.3	0.200	0.790
S57-13-3	14-25	B21t	1.30	0.50	tr	0.10	1.90	4.40	6.30	30	0.13	---	6.3	5.2	5.5	0.300	1.350
S57-13-4	25-47	B22t	1.00	0.80	tr	0.10	1.90	5.60	7.50	25	0.09	---	6.3	5.2	5.6	0.350	2.240
S57-13-5	47-73	B23t	1.10	0.40	tr	tr	1.50	4.00	5.50	27	0.12	---	5.6	5.0	4.7	0.300	2.100
Pactolus:																	
S57-22-1	0-5	A11	0.20	0.10	tr	tr	0.30	11.20	11.50	3	2.33	0.04	4.8	4.2	4.0	---	---
S57-22-2	5-8	A12	0.10	tr	tr	tr	0.10	5.00	5.10	2	0.05	0.04	5.0	4.5	4.3	0.119	1.156
S57-22-3	8-17	C1	tr	tr	tr	tr	tr	2.00	2.00	0	0.26	0.02	4.8	4.5	4.4	0.084	0.164
S57-22-4	17-30	C2	tr	tr	tr	tr	tr	1.30	1.30	0	0.08	0.02	4.9	4.4	4.3	0.093	0.220
S57-22-5	30-52	C3	0.10	tr	tr	tr	0.10	1.10	1.20	8	0.06	0.02	5.1	4.5	4.4	0.083	0.287
S57-22-6	52-80	C4	tr	tr	tr	tr	tr	0.80	0.80	0	0.04	0.01	5.5	5.0	4.8	0.016	0.017
Red Bay:																	
S57-24-1	0-8	Ap	2.60	0.30	tr	0.10	3.00	10.90	13.90	22	1.78	0.11	5.3	4.9	4.6	0.350	1.000
S57-24-2	8-14	B1	0.80	0.10	tr	0.10	1.00	6.20	7.20	14	0.64	0.04	5.3	4.7	4.4	0.262	1.500
S57-24-3	14-51	B21t	0.80	0.20	tr	tr	1.00	3.80	4.80	21	0.19	0.03	5.5	5.1	4.8	0.237	2.140
S57-24-4	51-80	B22t	0.25	0.10	0.00	0.01	0.36	1.81	2.17	17	0.15	0.03	5.6	5.3	5.2	0.200	1.665
Rutlege:																	
S57-40-1	0-12	A11	0.01	0.04	0.04	0.03	0.12	9.80	9.92	1	1.70	0.06	5.0	4.5	4.4	---	---
S57-40-2	12-21	A12	0.00	0.03	0.01	0.00	0.04	6.80	6.84	1	0.72	0.03	5.5	4.9	4.7	---	---
S57-40-3	21-61	Cg	---	---	---	---	---	---	---	---	0.13	0.03	6.3	5.5	4.4	---	---
Tifton:																	
S57-33-1	0-8	Apcn	0.90	0.20	tr	0.20	1.30	7.10	8.40	15	0.82	0.08	4.9	4.6	4.0	---	---
S57-33-2	8-19	B21tcn	1.40	0.20	tr	0.10	1.70	5.90	7.60	22	0.22	0.08	5.2	4.9	4.4	0.430	1.600
S57-33-3	19-30	B21tcn	0.70	0.10	tr	tr	0.80	5.90	6.70	12	0.13	0.06	5.0	4.9	4.5	0.500	1.940
S57-33-4	30-42	B22tcn	0.40	0.10	tr	tr	0.50	5.70	6.20	8	0.11	0.07	4.9	4.7	4.5	0.460	2.020
S57-33-5	42-58	B23tcn	0.20	0.20	tr	tr	0.40	5.60	6.00	7	0.08	0.05	4.6	4.4	4.3	0.400	2.430
S57-33-6	58-70	B24t	0.30	0.30	tr	tr	0.60	6.40	7.00	9	0.00	0.04	4.6	4.3	3.9	0.300	2.420

TABLE 20.--CHEMICAL PROPERTIES OF SELECTED SOILS--Continued

Soil series and sample number	Depth	Horizon	Extractable bases					Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	Reaction			Dithionite-citrate extract	
			Ca	Mg	Na	K	Sum						H_2O	$CaCl_2$	KCl	Al	Fe
	In		meq/100 grams							Pct	Pct	mmho/cm	pH	pH	pH	Pct	Pct
Troup:																	
S57-10-1	0-3	A1	0.59	0.13	0.07	0.05	0.84	7.34	8.18	10	1.13	---	4.9	4.2	4.0	0.150	0.310
S57-10-2	3-21	A21	0.13	tr	tr	tr	0.13	3.23	3.36	4	0.26	---	4.9	4.2	4.1	0.150	0.380
S57-10-3	21-39	A22	0.07	0.07	tr	tr	0.14	2.30	2.44	6	0.07	---	5.1	4.3	4.1	0.150	0.370
S57-10-4	39-55	A23	0.06	0.09	tr	tr	0.15	2.26	2.41	6	0.04	---	5.2	4.3	4.1	0.150	0.430
S57-10-5	55-60	B21t	0.09	0.16	tr	tr	0.25	3.23	3.48	7	0.08	---	5.5	4.5	4.3	0.150	1.240
S57-10-6	60-80	B22t	0.06	0.13	tr	tr	0.19	3.39	3.58	5	---	---	5.6	4.6	4.7	0.400	1.930

* Certain horizons in the Kureb and Leon pedons were tested for carbon, iron, and aluminum by the pyrophosphate extraction method. The results, in percent, are as follows:

	C	Fe	Al
Kureb:			
S57-47-3	0.34	0.09	0.10
Leon:			
S57-46-3	1.55	0.01	0.25
S57-46-4	1.47	0.02	0.30

TABLE 21.--CLAY MINERALOGY OF SELECTED SOILS

Soil series and sample number	Depth	Horizon	Montmorillonite	14-Angstrom intergrade	Kaolinite	Gibbsite	Quartz	Mica
	In		Percent of total clay					
Albany:								
S57-37-1	0-5	A1	0	38	10	18	34	0
S57-37-3	17-25	A22	0	42	12	25	21	0
S57-37-6	52-67	B21t	0	25	21	46	8	0
S57-37-7	67-80	B22t	0	6	63	29	2	0
Angie Variant:								
S57-30-1	0-4	A1	0	48	29	0	23	0
S57-30-3	7-11	B21t	35	30	25	0	10	0
S57-30-7	52-76	B25tg	58	tr	27	0	15	0
Bohicket:								
S57-45-3	45-80	IIC2g	34	15	39	0	12	0
Bonifay:								
S57-12-3	6-30	A21	0	53	9	23	17	0
S57-12-5	47-51	B1	0	41	11	36	12	0
S57-12-6	51-63	B2t	0	42	12	41	5	0
Dothan:								
S57-26-1	0-6	A1	0	60	13	16	11	0
S57-26-3	14-30	B21t	0	39	25	29	7	0
S57-26-5	43-60	B23t	0	24	42	29	5	0
Escambia:								
S57-23-1	0-7	A1	0	62	20	0	18	0
S57-23-2	7-10	A3	0	64	22	0	14	0
S57-23-5	19-37	B22t	0	15	10	0	75	0
Esto:								
S57-38-1	0-4	A1	0	23	16	0	61	0
S57-38-4	12-16	B21t	0	13	53	6	14	14
S57-38-7	34-49	B24t	0	25	36	9	12	18
S57-38-9	61-78	C1g	0	49	22	0	13	16
Fuquay:								
S57-39-1	0-4	A11	0	46	11	27	16	0
S57-39-5	37-43	B21t	0	30	17	48	5	0
S57-39-7	59-80	B3	0	38	19	39	4	0
Garcon:								
S57-42-1	0-4	A11	0	43	10	0	47	0
S57-42-4	20-31	A22	0	46	21	0	33	0
S57-42-6	39-51	B22t	0	32	58	0	10	0
S57-42-9	69-80	C2	0	19	66	0	15	0
Kalmia:								
S57-36-1	0-5	A11	31	38	17	0	14	0
S57-36-4	17-31	B2t	38	33	24	0	5	0
S57-36-6	42-49	IIC1	58	0	35	0	7	0
S57-36-9	90-96	IIC4	51	0	33	0	10	6
Kureb:								
S57-47-1	0-3	A1	0	20	0	0	80	0
S57-47-3	16-24	C&Bh	0	30	3	0	67	0
S57-47-6	55-80	C3	0	32	9	0	59	0
Lakeland:								
S57-9-3	8-32	C2	0	50	19	0	31	0

TABLE 21.--CLAY MINERALOGY OF SELECTED SOILS

Soil series and sample number	Depth	Horizon	Montmorillonite	14-Angstrom intergrade	Kaolinite	Gibbsite	Quartz	Mica
	In		Percent of total clay					
Leon:								
S57-46-1	0-2	A1	0	0	0	0	100	0
S57-46-3	16-21	B21h	0	31	8	0	61	0
S57-46-6	32-44	C1	0	29	6	0	65	0
Lucy:								
S57-27-1	0-10	Ap	0	48	11	30	11	0
S57-27-3	18-26	A3	0	40	14	38	8	0
S57-27-6	41-60	B22t	0	31	20	46	13	0
Lynchburg:								
S57-28-1	0-4	A1	0	57	28	0	15	0
S57-28-3	9-17	B1	10	40	39	0	11	0
S57-28-5	25-44	B22t	0	47	44	0	9	0
S57-28-7	60-80	B24t	20	32	36	0	7	5
Maxton:								
S57-31-1	0-6	A1	22	33	25	0	20	0
S57-31-3	10-14	B11	24	32	31	0	13	0
S57-31-5	19-32	B2t	22	21	39	0	12	6
S57-31-7	38-59	IIC1	31	20	29	0	10	10
Mulat:								
S57-41-1	0-4	A11	15	23	31	0	31	15
S57-41-4	17-27	A22	0	24	33	0	33	0
S57-41-5	27-34	B21tg	0	36	49	0	15	0
S57-41-8	57-71	C2g	0	19	52	0	29	0
Orangeburg:								
S57-13-3	14-25	B21t	0	41	14	37	8	0
S57-13-4	25-47	B22t	0	36	16	45	3	0
S57-13-5	47-73	B23t	0	35	19	44	2	0
Pactolus:								
S57-22-1	0-5	A11	0	42	9	25	24	0
S57-22-5	30-52	C3	0	42	12	22	24	0
Red Bay:								
S57-24-3	14-51	B21t	0	26	10	47	17	0
Rutlege:								
S57-40-1	0-12	A11	0	37	9	0	54	0
S57-40-3	21-61	Cg	0	37	9	0	54	0
Tifton:								
S57-33-1	0-8	Apcn	0	50	16	23	11	0
S57-33-2	8-19	B21tcn	0	37	17	36	10	0
S57-33-4	30-42	B22tcn	0	31	18	46	4	0
S57-33-6	58-70	B24t	0	23	47	22	6	2
Troup:								
S57-10-3	21-39	A22	0	55	10	24	11	0
S57-10-5	55-60	B21t	0	35	9	49	7	0
S57-10-6	60-80	B22t	0	38	11	48	3	0

TABLE 22.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Albany	Loamy, siliceous, thermic Grossarenic Paleudults
Angie Variant	Clayey, mixed, thermic Aquic Paleudults
Bibb	Coarse-loamy, siliceous, acid, thermic Typic Fluvaquents
Bohicket	Fine, mixed, nonacid, thermic Typic Sulfaquents
Bonifay	Loamy, siliceous, thermic Grossarenic Plinthic Paleudults
Chewacla	Fine-loamy, mixed, thermic Fluvaquentic Dystrochrepts
Cowarts	Fine-loamy, siliceous, thermic Typic Hapludults
Dorovan	Dysic, thermic Typic Medisaprists
Dothan	Fine-loamy, siliceous, thermic Plinthic Paleudults
Escambia	Coarse-loamy, siliceous, thermic Plinthaquic Paleudults
Esto	Clayey, kaolinitic, thermic Typic Paleudults
Fuquay	Loamy, siliceous, thermic Arenic Plinthic Paleudults
Garcon	Loamy, siliceous, thermic Arenic Hapludults
Handsboro	Euic, thermic Typic Sulfihemists
Johns	Fine-loamy over sandy or sandy-skeletal, siliceous, thermic Aquic Hapludults
Kalmia	Fine-loamy over sandy or sandy-skeletal, siliceous, thermic Typic Hapludults
Kinston	Fine-loamy, siliceous, acid, thermic Typic Fluvaquents
Kureb	Thermic, uncoated Spodic Quartzipsamments
Lakeland	Thermic, coated Typic Quartzipsamments
Leon	Sandy, siliceous, thermic Aeric Haplaquods
Lucy	Loamy, siliceous, thermic Arenic Paleudults
Lynchburg	Fine-loamy, siliceous, thermic Aeric Paleaquults
Maxton	Fine-loamy over sandy or sandy-skeletal, siliceous, thermic Typic Hapludults
Mulat	Coarse-loamy, siliceous, thermic Typic Ochraquults
Orangeburg	Fine-loamy, siliceous, thermic Typic Paleudults
Ortega	Thermic, uncoated Typic Quartzipsamments
Pactolus	Thermic, coated Aquic Quartzipsamments
Pamlico	Sandy or sandy-skeletal, siliceous, dysic, thermic Terric Medisaprists
Pickney	Sandy, siliceous, thermic Cumulic Humaquepts
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Red Bay	Fine-loamy, siliceous, thermic Rhodic Paleudults
Riverview	Fine-loamy, mixed, thermic Fluventic Dystrochrepts
Rutlege	Sandy, siliceous, thermic Typic Humaquepts
Tifton	Fine-loamy, siliceous, thermic Plinthic Paleudults
Troup	Loamy, siliceous, thermic Grossarenic Paleudults
Wahee	Clayey, mixed, thermic Aeric Ochraquults

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