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

Soil Survey of Clay County, Florida

How To Use This Soil Survey

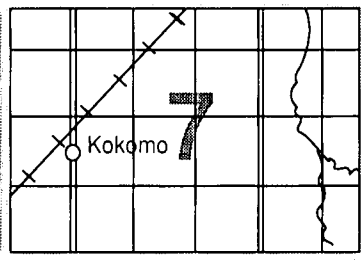
General Soil Map

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

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

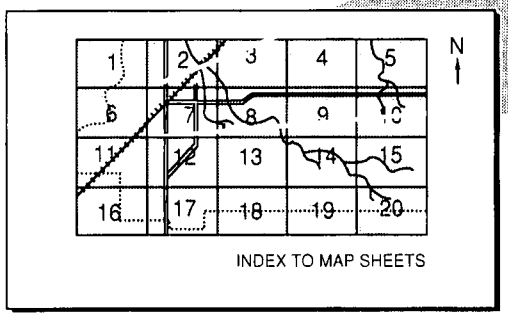
Detailed Soil Maps

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



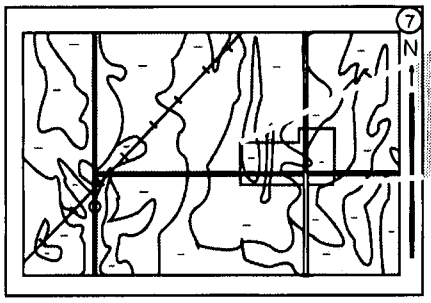
MAP SHEET

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

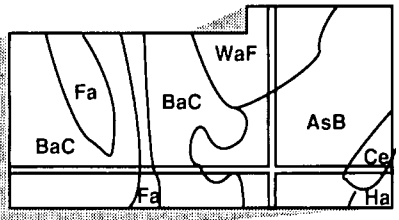


INDEX TO MAP SHEETS

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



MAP SHEET



AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

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

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

Major fieldwork for this soil survey was completed in July 1985. Soil names and descriptions were approved in 1985. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1985. This soil survey was made cooperatively by the Soil Conservation Service and the University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations and Soil Science Department, Florida Department of Agriculture and Consumer Services, and Florida Department of Transportation. It is part of the technical assistance furnished to the Clay Soil and Water Conservation District. The Clay County Board of County Commissioners contributed financially to the acceleration of the survey.

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.

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

Cover: This area of soils in the Hurricane-Leon-Mandarin general soil map unit is used as pasture, which is occasionally cut for hay. Most areas of these soils are planted to pine trees or are left in native vegetation.

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Foreword

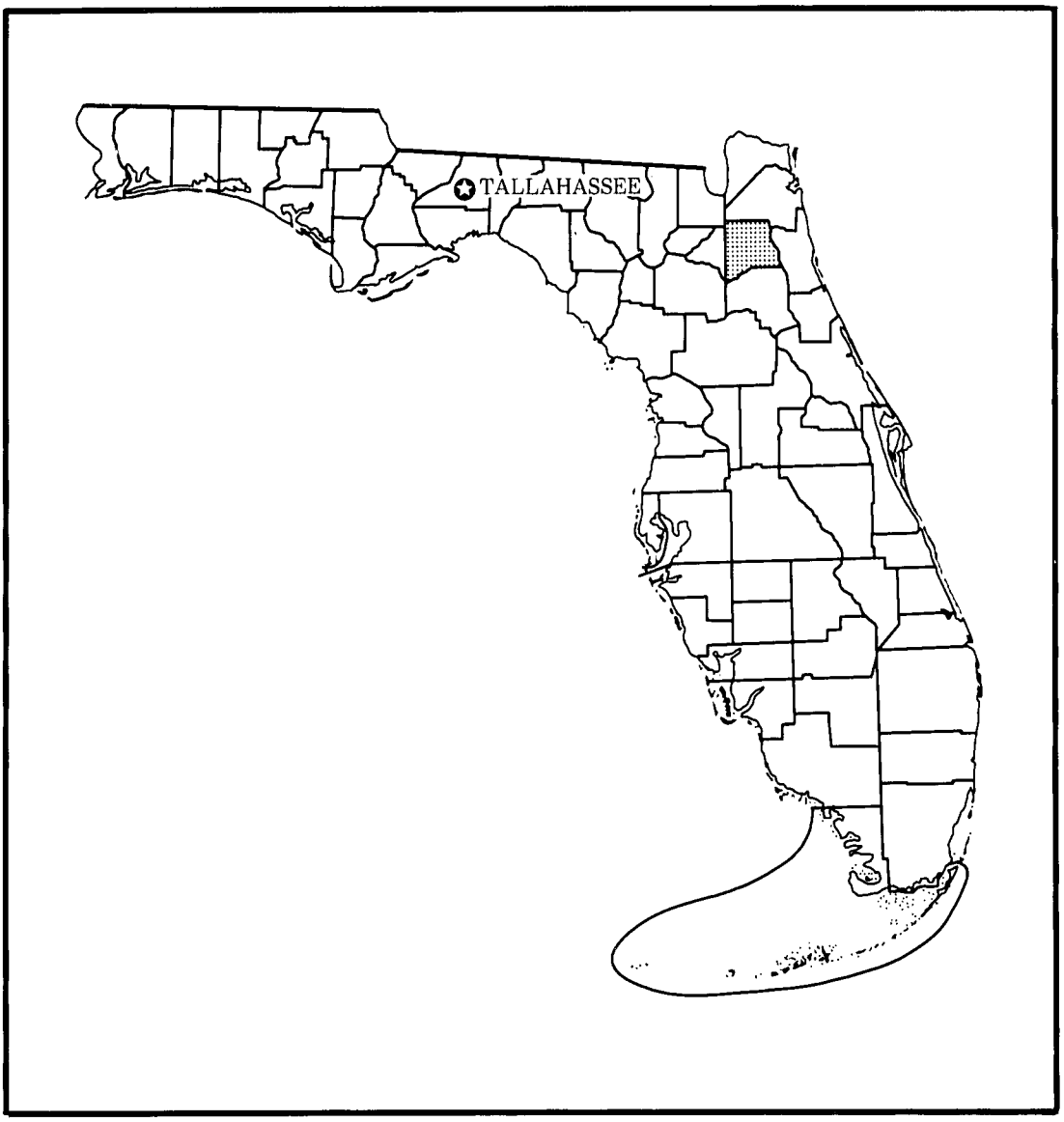
This soil survey contains information that can be used in land-planning programs in Clay County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of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

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

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are 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.

James W. Mitchell
State Conservationist
Soil Conservation Service



Location of Clay County in Florida.

Soil Survey of Clay County, Florida

By Robert L. Weatherspoon, Eddie Cummings, and William H. Wittstruck

Others participating in the fieldwork were Buster Thomas, Frank Doonan, Ken Liudahl, and David E. Wilkinson, Soil Conservation Service

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

CLAY COUNTY is in the northeastern part of the Florida peninsula on the western side of the St. Johns River. The total land area of the county is 379,008 acres, or 644 square miles, and approximately 24,380 acres of large bodies of water.

Green Cove Springs, the county seat, is in the east-central part of the county on the St. Johns River. The population of Clay County is mainly centered in and around Green Cove Springs and in the northeastern and northwestern parts of the county. The total population of the county is about 74,524 *(3)*. Orange Park, with a population of about 42,000, is the largest city. Agriculture, forestry, and mining are the main businesses. The county also supports some light industry.

General Nature of the County

In this section, environmental and cultural factors that affect the use and management of soils in Clay County are discussed. The factors are climate; settlement; and geology, physiography, and drainage.

Climate

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

Clay County has a moderate climate. It is favorable for the production of crops, livestock, and pine trees. The summers are long, hot, and humid. Winters are cool to occasionally cold.

Mean annual precipitation in Clay County for the period 1951-80 was about 53 inches *(14)*. Rainfall is heaviest from June through September; November and December are the driest months. About 40 percent of the annual rainfall is in the summer and results from afternoon and evening thundershowers. Precipitation is evenly distributed during the rest of the year.

Hail falls occasionally during thundershowers, but the hailstones generally are small and seldom cause much damage. Snow is very rare and generally melts as it hits the ground.

Heavy summer thundershowers can produce 2 or 3 inches of rainfall in 1 or 2 hours. Daylong rains in the summer are rare. When they occur, they are generally associated with tropical storms. The average relative humidity is about 75 percent.

Tropical storms can affect the area from early June through mid-November. Hurricane-force winds rarely develop because of the county's inland location. The heavy rains associated with these storms can cause rivers to overflow.

Table 1 gives data on temperature and precipitation for the survey area as recorded in the period 1951 to 1980. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. In winter the average temperature is 56 degrees, and the average daily minimum temperature is 45 degrees. The lowest

temperature on record, which occurred in December 1983, is 11 degrees. In summer the average temperature is 81 degrees, and the average daily maximum temperature is 91 degrees. The highest recorded temperature, which occurred in July 1942, is 105 degrees *(15)*.

Settlement

Florida was obtained from Spain by treaty in 1821. Clay County was established by the Florida Legislature on December 31, 1858. It was named in honor of Henry Clay, a prominent 19th century statesman. As established, Clay County included four municipalities, the oldest of which are Green Cove Springs, Orange Park, Keystone Heights, and Penney Farms. Green Cove Springs was chartered in 1874, Orange Park in 1879, Keystone Heights in 1925, and Penney Farms in 1927.

Before the Spaniards arrived, the area was occupied by the Timucuan Indians. By 1728, the Timucuan Indians had been almost eliminated by a succession of raids by the English and their Lower Creek and Seminole Indian allies. The Spanish ownership of Florida continued until 1763, when the English acquired it. The English maintained ownership until 1783. During this period, a Seminole village was on the Old Spanish Road in what is now Clay County.

Permanent settlement of Clay County began during the second Spanish rule. In 1860, the population of the county was 1,914. Many early settlers were from Georgia. Shortly after the Civil War, the mineral waters at Green Cove Springs and Magnolia Springs attracted many winter tourists. Hotels opened and the town prospered from the many visitors to the mineral springs. The extremely freezing weather in 1895 and the development of south Florida caused a decline in tourism after the turn of the century.

Much of Clay County's prosperity and growth during this period was associated with the expansion of woodland production and other agricultural cash crops. In the 1930's, the county turned more and more from lumber to naval stores; plants produced about 252,000 gallons of turpentine and 16,000 barrels of resin annually. The emphasis on forestry has continued; but now, the major product is pulp, and most woodland acreage is owned by national paper companies. The citrus industry almost vanished after the great freeze and vegetable crops, beef cattle, poultry production, and dairy farming became the major agricultural operations in the county.

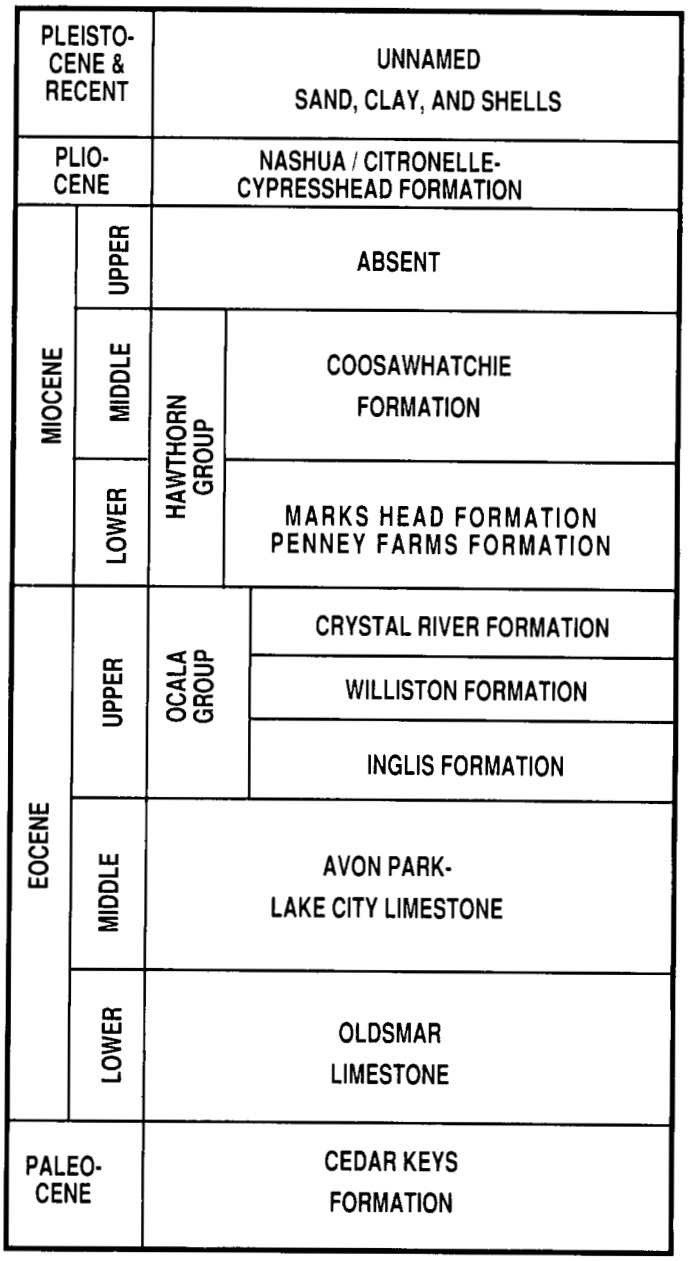


Figure 1.—Cenozoic stratigraphic column of Clay County, Florida.

Geology, Physiography, and Drainage

Thomas M. Scott, Ph.D., senior geologist, Department of Natural Resources, Florida Geological Survey, Bureau of Geology, prepared this section.

Geology

Clay County is in northeastern peninsular Florida,

inland from the Atlantic coastline. Geomorphically, Clay County is in the northern or proximal zone *(16)*.

Clay County is underlain by an average of nearly 4,000 feet of sedimentary rocks that range in age from the early Paleozoic era to the Recent. The sediments of the Cenozoic era consist of carbonate sediments that have stratified layers nearly 1,800 feet, or 555 meters, thick (fig. 1).

The oldest Cenozoic era sediments in this area belong to the Cedar Keys Formation of Paleocene age (fig. 1), and the youngest sediments belong to the unnamed formation of the Recent or Pleistocene age (figs. 1 and 2).

The materials of Recent and Pleistocene age are composed of quartz sand, clay, and shell material (fig. 1). The Trail Ridge and Northern Highlands, which range from 100 to 175 feet above sea level, make up the western part of the county. The Duval Upland, which ranges from 75 to 100 feet above sea level, makes up the central part. The isolated Peoria Hill and the Eastern Valley physiographic regions, which range from 0 to 75 feet above sea level, occupy the eastern edge (fig. 3).

The Pleistocene and Recent deposits in Clay County have not been accurately delineated or named. They consist of quartz sand, clay, and shell material. The thickness of these sediments is not accurately known.

Unconsolidated sediments of shelly sand and clay are between the surface material and the upper part of the porous limestone in the Floridan Aquifer. In the upper part, these materials are upper Miocene age or Pliocene age deposits. The thickness of this formation is not currently known. It is in the southeastern part of Clay County. In the western part of Clay County, the sands are underlain by the Hawthorn Formation. These sands are slightly clayey, silty, poorly sorted, and poorly indurated quartz sands. These sediments are thought to be the nonmarine to the near shore marine of the Nashua Formation. The thickness of this formation is more than 150 feet.

The lower part of the consolidated sediments of the shelly sand and clay material of the Hawthorn Formation contains some phosphatic materials *(7)*. The thickness ranges from 100 feet to 300 feet in the western part of the county and from 300 feet to 350 feet in the eastern part. The sediments and formations above the Floridan Aquifer are the source of ground water supplies for most areas in the county where central water systems and deep wells are often used for municipal and industrial purposes that require large quantities of water.

The Floridan Aquifer is composed of many limestone

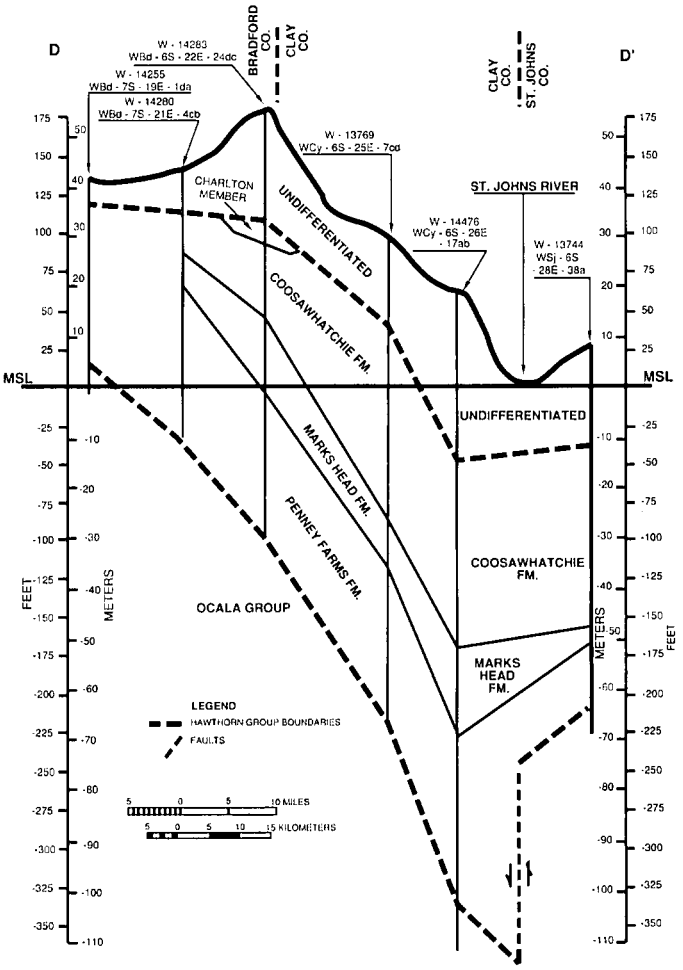


Figure 2.—Geologic cross section of Clay County, Florida. The numbers preceded by "w" are well numbers.

and dolomite formations of Eocene Age. This aquifer is one of the most productive in the world. The limestone and dolomite formations are made up of carbon materials that range from very hard and continuous to very soft and discontinuous. The very soft materials contain many solution cavities, which hold and transmit large quantities of water. Most of the freshwater supplies for agricultural use and for large domestic users are from the Floridan Aquifer *(4)*.

Physiography

Clay County can be divided into five general regions based on physiography (fig. 3). These regions are Trail Ridge, Northern Highlands, Duval Upland, Peoria Hill, and Eastern Valley.

Trail Ridge is the oldest and highest region in Clay

County. It is in the western extremity of the county. The Trail Ridge elevation of 252 feet *(5)* is the highest in northeastern Florida and forms hills, high plateaus, and relatively steep scarps. The geologic material consists of quartz sand, clay, and shell material. The soils are poorly drained to excessively drained. The vegetation is made up mainly of slash pine, longleaf pine, water oak, laurel oak, post oak, turkey oak, bluejack oak, and live oak. The understory is palmettos, carpetgrass, and various panicums. Much of this area has been used for mining heavy minerals.

Northern Highlands is in the southwestern part of the county. It consists of many lakes and ponds and has excessively drained soils. The vegetation is made up of slash pine, longleaf pine, sand pine, turkey oak, bluejack oak, post oak, and live oak. Most of the soils are mineral soils that are predominantly sand or fine sand.

Duval Upland is in the central part of the county, extending from the north to the south. The soils mostly are nearly level, somewhat poorly drained or poorly drained, and sandy. Some soils on the higher elevations are gently sloping, moderately well drained or somewhat poorly drained, and sandy. The natural vegetation on lower elevations includes slash pine, loblolly pine, and longleaf pine. The natural vegetation on higher elevations is slash pine, longleaf pine, sand pine, turkey oak, bluejack oak, post oak, and live oak. Most of this area has been used for woodland production.

Peoria Hill is in the northeast corner of the county. The soils mostly are nearly level to gently sloping, moderately well drained or somewhat poorly drained, and sandy and loamy. The natural vegetation on higher elevations is slash pine, longleaf pine, sand pine, turkey oak, bluejack oak, post oak, and live oak. The natural vegetation on lower elevations is mainly longleaf pine, slash pine, a few loblolly pine, and cypress. Some of this area has been used for urban development.

Eastern Valley is in the eastern part of Clay County. It is mostly east of the Duval Upland region and extends eastward to the St. Johns River. This region consists mostly of flatwoods and swamps. The soils are sandy and loamy and are poorly drained or very poorly drained. Most of the soils have a loamy subsoil or a sandy subsoil that contains organic accumulations. The natural vegetation is made up of slash pine, longleaf pine, and saw palmetto on the flatwoods and of hardwoods and cypress in the swamps. This region is used mostly for pine tree production.

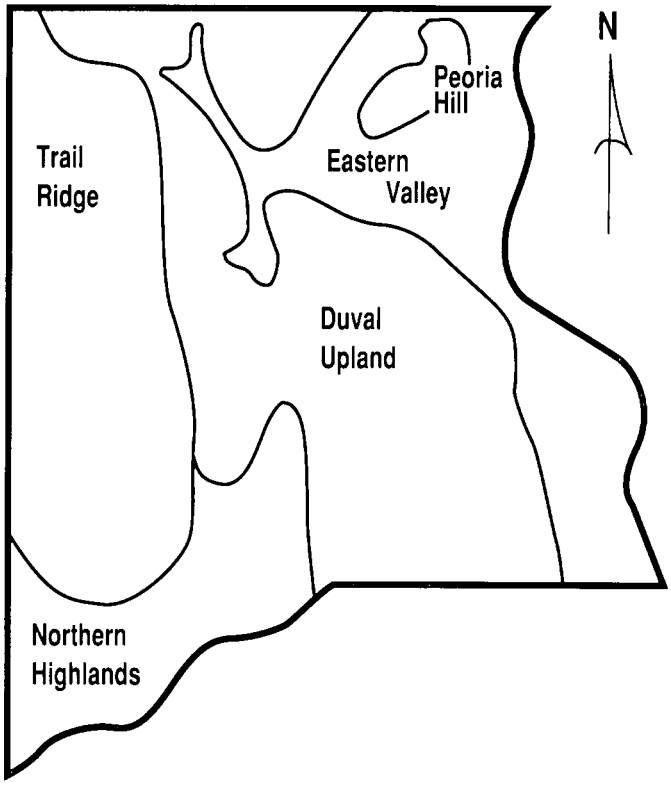


Figure 3.—Physiographic map of Clay County, Florida.

Drainage

Drainage in Clay County is affected by many rivers, streams, and creeks. The St. Johns River flows northward along the eastern boundary of the county. Its entire reach along the county is affected by tides, and the stage of the river rises and falls with each change of tide. Black Creek drains about 431 square miles of Clay County. South Fork Black Creek heads in Stevens Lake, which is about 4 miles south of Kingsley Lake. Its major tributaries are Ates Creek and Green Creek from the south and Bull Creek, which drains the central part of the county. North Fork Black Creek heads in Kingsley Lake. Its principal tributary is Yellow Water Creek, which drains about 10 square miles of north-central Clay County. The north and south forks of Black Creek join at Middleburg and form Black Creek, which flows eastward to the St. Johns River.

The headwaters of Etonia Creek and its tributaries from the north drain about 90 square miles of southern Clay County. The upper 150 miles of the basin in southwestern Clay County and in northwestern Putnam County contains about 100 lakes. Many of these lakes

have no surface outlet. Runoff from the upper part of the basin is extremely low mainly because of seepage to ground water and evaporation from the lakes. Flooding has occurred several times in the upper part of the basin.

How This Survey Was Made

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

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

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

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

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

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

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

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area

dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. In the detailed soil map units, these latter soils are called inclusions or included soils. In the general soil map units, they are called soils of minor extent.

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

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

General Soil Map Units

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

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

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

The soils in the survey area vary widely in their potential for major land uses. Table 3 shows the extent of the map units shown on the general soil map. It lists the potential of each, in relation to that of the other map units, for major land uses and shows soil properties that limit use. Soil potential ratings are based on the practices commonly used in the survey area to overcome soil limitations. These ratings reflect the ease of overcoming the limitations. They also reflect the problems that will persist even if such practices are used.

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

Soils on the Sand Ridges

The two general soil map units in this group consist of nearly level to moderately sloping, excessively drained and moderately well drained soils on the uplands. These soils are sandy throughout. Some have lamellae of loamy sand at a depth of more than 57 inches. The soils in this map unit are in the southwestern part of the county.

1. Penney-Kershaw-Ortega

Nearly level to moderately sloping, excessively drained and moderately well drained soils that are sandy throughout; some have thin lamellae of loamy fine sand at a depth of more than 57 inches

The soils in this map unit are on broad, rolling, sandy uplands that are interspersed with some small lakes and ponds. One relatively large area surrounds the town of Keystone Heights in the southwestern part of Clay County. The mapped areas are mostly irregular in shape to somewhat circular.

This map unit makes up 44,697 acres, or about 12 percent of the county. It is about 46 percent Penney soils, about 29 percent Kershaw soils, about 14 percent Ortega soils, and about 11 percent soils of minor extent.

The landscape is mainly nearly level to moderately sloping. Sharp breaking, relatively long and circular but narrow areas of steeper slopes are interspersed. Some landlocked lakes and ponds are mostly in small, saucer-shape depressions. Drainage is subterranean. The water level of the lakes and ponds fluctuates considerably with the season. The level depends on rainfall and the seepage from the surrounding deep, sandy soils.

The natural vegetation is slash pine, longleaf pine, sand pine, turkey oak, bluejack oak, post oak, and live oak. The understory vegetation includes pineland threeawn, low panicum, lopsided indiangrass, rosemary, and lichens. The vegetation in the lakes and ponds is

mostly water-tolerant grasses and sedges and a few cypress, bay, and gum trees.

Penney soils are excessively drained. Typically, the surface layer is gray fine sand about 3 inches thick. The underlying material is fine sand. The upper part, to a depth of 17 inches, is brownish yellow. The next layer, to a depth of 45 inches, is yellow. Below that layer, to a depth of 57 inches, the underlying material is very pale brown. The lower part to a depth of 80 inches or more is very pale brown fine sand that contains thin lamellae of yellowish brown loamy fine sand.

Kershaw soils are excessively drained. Typically, the surface layer is dark grayish brown sand about 4 inches thick. The upper part of the underlying material, to a depth of 68 inches, is brownish yellow fine sand. The lower part to a depth of 80 inches is yellow fine sand.

Ortega soils are moderately well drained. Typically, the surface layer is dark grayish brown fine sand about 3 inches thick. The underlying material is fine sand. The upper part, to a depth of 18 inches, is very pale brown. The middle part, to a depth of 62 inches, is yellow with mottles. The lower part to a depth of 80 inches or more is white.

The minor soils in this map unit are Ona, Osier, Pamlico, Ridgeland, Ridgewood, and Troup soils. Ona, Osier and Ridgeland soils are in the slightly lower, wetter, nearly flat areas and poorly defined drainageways. Pamlico soils are in wet depressional areas. Ridgewood and Troup soils are on the gently rolling uplands.

Most areas of this map unit are in woodland. Most of the remaining acreage is in pasture. A small part is used for recreational and urban development.

The use of the soils in this map unit as cropland is severely limited because of low fertility and droughtiness. These soils are only moderately suited to pasture.

The potential for seepage, the loose sandy texture, and wind erosion are the major limitations affecting most urban development. Limitations affecting homesites or sites for small commercial buildings are slight. Lawns require a liberal amount of water and frequent applications of fertilizer. Unpaved streets and roads can become difficult to travel because of the loose, dry, sandy texture of the soils. Wind erosion is a severe hazard on sites where the surface is unprotected.

2. Ortega-Penney-Centenary

Nearly level to moderately sloping, moderately well drained and excessively drained soils that are sandy throughout; some have thin lamellae of loamy fine sand at a depth of more than 57 inches; and some have a subsoil that is coated with organic matter at a depth of more than 50 inches

This map unit is mainly in the central part of Clay County, but some areas of these soils are throughout the county. These soils are on broad, rolling, sandy uplands that are interspersed with some small streams, creeks, and drainageways. The mapped areas range from small to large and are mostly elongated or irregular in shape.

This map unit makes up 53,120 acres, or about 14 percent of the county. It is about 31 percent Ortega soils, about 28 percent Penney soils, 11 percent Centenary soils, and about 30 percent soils of minor extent.

The landscape is mainly nearly level to moderately sloping. Sharp breaking, relatively long but narrow areas of steeper slopes are interspersed. Small wet areas are interspersed in this map unit. These areas generally are along the sides and base of the slopes and in drainageways and depressional areas. Drainage is both subterranean and surface.

The natural vegetation is slash pine, longleaf pine, sand pine, turkey oak, bluejack oak, post oak, and live oak. The understory vegetation includes pineland threeawn, low panicum, lopsided indiangrass, rosemary, and lichens. The vegetation on the wetter soils is cypress, bay, gum, and maple trees.

Ortega soils are moderately well drained. Typically, the surface layer is dark grayish brown fine sand 3 inches thick. The underlying material is fine sand. The upper part, to a depth of 18 inches, is very pale brown. The middle part, to a depth of 62 inches, is yellow with mottles. The lower part to a depth of 80 inches or more is white.

Penney soils are excessively drained. Typically, the surface layer is gray fine sand about 3 inches thick. The underlying material is fine sand. The upper part, to a depth of 17 inches, is brownish yellow. The next layer, to a depth of 45 inches, is yellow. Below that layer, to a depth of 57 inches, the underlying material is very pale brown. The lower part to a depth of 80 inches or more is very pale brown fine sand that contains thin lamellae of yellowish brown loamy fine sand.

Centenary soils are moderately well drained. Typically, the surface layer is very dark grayish brown fine sand about 5 inches thick. The subsurface layer is fine sand. The upper part, to a depth of 10 inches, is brown. The middle part, to a depth of 43 inches, is very pale brown with mottles. The lower part, to a depth of

54 inches, is light gray. The subsoil is fine sand. The upper part, to a depth of 60 inches or more, is dark reddish gray. The lower part to a depth of 80 inches is dark reddish brown.

The minor soils in this map unit are Albany, Blanton, Hurricane, Ocilla, Ousley, Osier, Ridgewood, and Rutlege soils. Albany, Blanton, Hurricane, Ocilla, and Ridgewood soils are intermixed and in similar positions on the landscape as the major soils. The drainage is variable in all of the soils in this map unit. Ousley soils are on terraces and the flood plains. Osier and Rutlege soils are in the drainageways and depressional areas.

Most areas of this map unit are in woodland. Most of the remaining acreage is in pasture. A small part has been developed for urban use.

Low fertility and droughtiness are severe limitations that affect cropland production. These soils are well suited to pasture.

The potential for seepage, which is caused by the deep, sandy texture of the soils, is the major restrictive feature for most urban uses. Limitations affecting homesites, small commercial buildings, and roads and streets are slight. Wind erosion can become a problem on sites that have been cleared of all protective vegetation. Limitations affecting septic tank absorption fields are mostly moderate; however, they vary from moderate to severe if the water table is close to the surface during wet periods and prevents good drainage.

Soils on the Flatwoods and on Slight Knolls and in Transitional Areas Between the Uplands and the Flatwoods

The six general soil map units in this group consist of nearly level to gently sloping, moderately well drained to poorly drained soils. Some of these soils are sandy throughout. Most soils have a sandy surface layer and subsurface layer. Some of these soils have a sandy subsoil that is coated with organic matter; and in some map units, the subsoil is sandy in the upper part and loamy in the lower part, or it is loamy or clayey within 20 inches of the soil surface.

3. Hurricane-Leon-Mandarin

Nearly level to gently sloping, somewhat poorly drained soils that are sandy throughout and have a subsoil coated with organic matter

This map unit is mostly in the northern and western parts of Clay County. One broad area is in the southwest part of the county. These soils are on slight knolls on the flatwoods and in the transitional areas between the uplands and the flatwoods. The mapped areas are small to relatively large and are irregular in shape or elongated.

This map unit makes up 108,160 acres, or about 29 percent of the county. It is about 31 percent Hurricane soils and similar Centenary soils, about 17 percent Leon soils, about 12 percent Mandarin soils, and about 40 percent soils of minor extent.

The landscape is either nearly level pine and saw palmetto flatwoods that are intermixed with slight knolls and gently rolling uplands or relatively broad, transitional areas that grade from the rolling uplands to the nearly level flatwoods. Small, wet depressions and long, narrow drainageways are throughout most areas. Drainage is both subterranean and surface.

The natural vegetation is slash and longleaf pines and water, laurel, post, turkey, bluejack, and live oaks. The understory vegetation is mostly waxmyrtle, sumac, blackberry, gallberry, saw palmetto, carpetgrass, pineland threeawn, huckleberry, bluestem, and various panicums. The vegetation in depressions and drainageways is mostly bay, cypress, gum, pond pine, and maple trees.

Hurricane soils are somewhat poorly drained. Typically, the surface layer is gray fine sand about 5 inches thick. The subsurface layer is fine sand. The upper part, to a depth of 10 inches, is brown. The middle part, to a depth of 29 inches, is very pale brown. The lower part, to a depth of 56 inches, is white. The subsoil is fine sand. The upper part, to a depth of 66 inches, is dark brown. The lower part to a depth of 80 inches is black.

Leon soils are poorly drained. Typically, the surface layer is very dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of about 16 inches, is light gray fine sand. The subsoil is fine sand. The upper part, to a depth of 20 inches, is black. The sand grains are well coated with organic material. The next layer, to a depth of 26 inches, is very dark grayish brown. The sand grains are coated with organic material. Below that layer, to a depth of 67 inches, the subsoil is dark brown. The lower part to a depth of 80 inches is black, and organic coatings are on most of the sand grains.

Mandarin soils are somewhat poorly drained. Typically, the surface layer is black fine sand about 5 inches thick. The subsurface layer, to a depth of 28 inches, is light gray fine sand. The upper part of the subsoil, to a depth of 33 inches, is black fine sand. The sand grains are well coated with organic material. The next layers, to a depth of 60 inches, are dark brown, dark yellowish brown, and grayish brown fine sand. The lower part to a depth of 80 inches is black loamy fine sand. The sand grains are coated with organic matter.

The minor soils in this map unit are Albany, Blanton, Ocilla, Ortega, Osier, Penney, and Rutlege soils. Albany and Ocilla soils are in the same positions on the landscape as the major soils. Blanton, Ortega, and Penney soils are in slightly higher positions on the landscape. Osier and Rutlege soils are in lower positions, including depressions and drainageways, than the major soils.

Most areas of this map unit are in natural vegetation and have been planted to woodland. Some areas are in pasture. A small part has been developed for urban use.

Periodic wetness and droughtiness are severe limitations affecting the use of the soils in this map unit for cultivated crops.

The potential for seepage, which is caused by the deep, sandy texture of the soils, and wetness are the major restrictive features for most urban uses. The limitations are slight to severe for homesites, small commercial buildings, and roads and streets. Wind erosion can become a problem on sites that have been cleared of all protective vegetation. The soils in this map unit have severe limitations as sites for septic absorption fields.

4. Albany-Blanton-Newnan

Nearly level to moderately sloping, somewhat poorly drained and moderately well drained soils that are sandy to a depth of 40 to 79 inches and have a loamy subsoil, and some have a sandy subsoil that is coated with organic matter and is underlain by a loamy subsoil

This map unit is in the northwest and central parts of the county. These soils are on slight knolls on the flatwoods and in the transitional areas between the uplands and the flatwoods. The mapped areas are small to medium and are irregular in shape or elongated. The total acreage is not extensive.

This map unit makes up 26,240 acres, or about 7 percent of the county. It is about 31 percent Albany soils, about 20 percent Blanton soils, about 14 percent Newnan soils, and about 35 percent soils of minor extent.

The landscape is nearly level areas that have a few gentle slopes. Elevation is only slightly different from adjacent areas. Some small depressions and ponded areas are included. Drainage is both subterranean and surface. Drainageways are intermittent, and some are poorly defined.

The natural vegetation is mostly slash pine, longleaf pine, water oak, live oak, laurel oak, and sweetgum trees. The understory vegetation includes running oak, saw palmetto, waxmyrtle, huckleberry, brackenfern, blueberry, gallberry, greenbrier, various bluestems and panicums, pineland threeawn, and other native grasses. The vegetation in the wet depressions and drainageways is mostly bay, gum, and cypress trees.

Albany soils are somewhat poorly drained. Typically, the surface layer is very dark gray fine sand about 6 inches thick. The subsurface layer, to a depth of 47 inches, is brown, very pale brown, and light gray mottled fine sand. The upper part of the subsoil, to a depth of 60 inches, is brownish yellow mottled fine sandy loam, and the lower part to a depth of 80 inches is light gray sandy clay loam with mottles.

Blanton soils are moderately well drained. Typically, the surface layer is dark grayish brown fine sand about 6 inches thick. The subsurface layer is fine sand. The upper part, to a depth of 20 inches, is very pale brown. The middle part, to a depth of 46 inches, is very pale brown with light gray mottles. The lower part, to a depth of 58 inches, is very pale brown with brown mottles. The subsoil extends to a depth of 80 inches or more. The upper 3 inches of the subsoil is pale brown and grades to light gray sandy clay loam below that layer.

Newnan soils are somewhat poorly drained. Typically, the surface layer is black fine sand about 5 inches thick. The subsurface layer, to a depth of 19 inches, is gray and light gray fine sand. The upper part of the subsoil, to a depth of 23 inches, is dark reddish brown fine sand. The sand grains are well coated with organic material. The next layer, to a depth of 29 inches, is dark brown fine sand. Below that layer, to a depth of 51 inches, is leached brown to light gray fine sand. The lower part of the subsoil to a depth of 80 inches is light gray sandy clay loam that is mottled.

The minor soils in this map unit are Centenary, Hurricane, Mandarin, Ocilla, Ortega, Osier, Plummer, Surrency, Ridgewood, and Rutlege soils. Centenary and Ortega soils are in a little higher position on the landscape than the major soils of this map unit. Hurricane, Mandarin, Ocilla, and Ridgewood soils are in the same position on the landscape as the major soils. Osier soils are in slightly lower positions on the flatwoods and in drainageways. Plummer, Surrency, and Rutlege soils are in depressional areas and drainageways.

Most areas of this map unit are in woodland. Most cleared areas are in pasture. A small part has been developed for urban use.

The soils in this map unit have severe limitations for cultivated crops because of periodic wetness and droughtiness. To grow crops, some form of water control is needed. The soils are well suited to pasture.

The soils in this map unit have severe limitations as sites for septic tank absorption fields, sewage lagoons, and trench-type landfill areas. The limitations affecting dwellings without basements, small commercial buildings, and local road and streets are moderate.

5. Osier-Plummer

Nearly level, poorly drained soils that are sandy throughout, and some are sandy to a depth of 40 to 79 inches and have a loamy subsoil

This map unit is in the southeastern part of Clay County. These soils are on the broad, nearly smooth, wet flatwoods.

This map unit makes up 7,103 acres, or about 2 percent of the county. It is about 52 percent Osier soils, 31 percent Plummer soils, and 17 percent soils of minor extent.

The landscape is broad, nearly smooth flatwoods intermixed with poorly defined drainageways and scattered small cypress ponds and depressions.

The natural vegetation is slash pine, loblolly pine, and longleaf pine or mixed pine and hardwood trees. The understory vegetation is mostly gallberry, waxmyrtle, threeawn, dwarf huckleberry, brackenfern, and various bluestems and panicums.

Typically, the surface layer of Osier soils is very dark gray fine sand about 5 inches thick. The underlying material is fine sand. The upper part, to a depth of 16 inches, is dark grayish brown. The next layer, to a depth of 33 inches, is grayish brown with yellowish brown mottles. Below that layer, to a depth of 48 inches, the underlying material is light brownish gray with brownish yellow mottles. The next layer, to a depth of 62 inches, is gray with strong brown mottles. The lower part to a depth of 80 inches is dark grayish brown with gray mottles.

Typically, the surface layer of Plummer soils is very dark grayish brown fine sand about 7 inches thick. The subsurface layer is fine sand. The upper part, to a depth of 24 inches, is grayish brown. The lower part, to a depth of 52 inches, is light brownish gray. The subsoil to a depth of 80 inches is gray, mottled sandy clay loam.

The minor soils in this map unit are Ridgewood, Leon, Mandarin, and Rutlege soils. Ridgewood and Mandarin soils are on slight knolls on the flatwoods. Leon soils are on the broad flatwoods. Rutlege soils are in the depressional areas.

Most areas of this map unit are in woodland. Cleared areas are used mostly for pasture.

Without some form of water control, the soils in this map unit are poorly suited to crops. If water is properly controlled, these soils are well suited to improved pasture.

Limitations affecting urban development are severe. Wetness is the major limiting factor. If these soils are used for urban development, a drainage system is needed to remove excess water during wet periods and to adequately control the high water table.

6. Pelham-Meggett

Nearly level, poorly drained soils that are sandy to a depth of 20 to 40 inches and have a loamy subsoil, and some are loamy to a depth of less than 20 inches and have a clayey subsoil

This map unit is mostly in the northeastern part of Clay County. These soils are in slightly lower positions on the flatwoods, and some are adjacent to the drainageways and flood plains.

This map unit makes up 19,990 acres, or about 5 percent of the county. It is about 47 percent Pelham soils, about 36 percent Meggett soils, and about 17 percent soils of minor extent.

The landscape is broad, nearly smooth flatwoods intermixed with ponds and scattered grassy depressions. Drainage is both subterranean and surface. Some areas of this map unit are subject to occasional flooding.

The natural vegetation is slash pine, longleaf pine, and loblolly pine, or mixed pine and hardwood trees. The hardwoods are mostly sweetgum, water oak, and maple trees. The understory vegetation is mostly gallberry, waxmyrtle, briers, holly, and native grasses. The vegetation in the ponds and depressional areas are ferns and water grasses and bay and cypress trees.

Typically, the surface layer of Pelham soils is very dark grayish brown fine sand about 4 inches thick. The subsurface layer is fine sand. The upper part, to a depth of 20 inches, is dark grayish brown. The lower part, to a depth of 26 inches, is light gray. The upper part of the subsoil, to a depth of 64 inches, is light gray and yellowish brown sandy clay loam with mottles. The lower part to a depth of 80 inches is light gray very fine sandy loam with mottles.

Typically, the surface layer of Meggett soils is very dark brown fine sandy loam about 6 inches thick. The subsurface layer, to a depth of about 11 inches, is grayish brown fine sandy loam. The upper part of the subsoil, to a depth of about 23 inches, is gray clay loam. The next layer, to a depth of about 46 inches, is gray sandy clay. The lower part to a depth of 80 inches or more is light olive gray clay.

The minor soils in this map unit are Albany, Allanton, Goldhead, Meadowbrook, Ocilla, Osier, Pamlico, Rutlege, and Sapelo soils. Albany and Ocilla soils are on slightly higher knolls on the flatwoods than the major soils. Allanton, Pamlico, and Rutlege soils are in the depressional areas. These soils also are intermixed with Meadowbrook and Osier soils in the drainageways. Goldhead, Meadowbrook, Osier, and Sapelo soils are in the same positions on the landscape as the major soils.

Most areas of this map unit are in natural vegetation. Some areas are in pasture. Some parts are used for urban development.

The soils in this map unit have severe limitations for cultivated crops because of wetness. If water is properly controlled, the soils are moderately well suited to some crops and vegetables. These soils are well suited to improved pasture if a water control system is established and maintained.

The limitations affecting urban uses are severe. The wetness, slow internal drainage, and high shrink-swell potential of the clayey subsoil in some of the soils in this map unit are the major limitations.

7. Leon-Mandarin-Pottsburg

Nearly level, poorly drained and somewhat poorly drained soils that are sandy throughout and have a subsoil that is coated with organic matter

This map unit is mostly in the south-central part of Clay County, but some small areas are in the central, northwest, and north-central parts of the county. These soils are on the flatwoods and are the second largest acreage of soils on the flatwoods in the county. The mapped areas vary in shape and size.

This map unit makes up 70,030 acres, or 18 percent of the county. It is about 35 percent Leon soils, 17 percent Mandarin soils and similar Ridgeland and Ona soils, 14 percent Pottsburg soils, and 34 percent soils of minor extent.

The landscape is nearly level pine and saw palmetto flatwoods interspersed with a few slight knolls, cypress ponds, swamps, and small, grassy, wet depressions. Some of the depressional areas are connected by narrow drainageways.

The natural vegetation is slash, loblolly, and longleaf pines. The understory vegetation is mostly saw palmetto, gallberry, waxmyrtle, dwarf huckleberry, blackberry, greenbrier, pineland threeawn, bluestem, and sedges. The vegetation in the ponds, swamps, and drainageways is mainly cypress, bay, and gum trees and water-tolerant grasses.

Leon soils are poorly drained. Some are in very poorly drained drainageways. Typically, the surface layer is very dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of about 16 inches, is light gray fine sand. The subsoil is fine sand. The upper part, to a depth of 20 inches, is black. The sand grains are well coated with organic material. The next layer, to a depth of 26 inches, is very dark grayish brown. The sand grains are coated with organic material. Below that layer, to a depth of 67 inches, the subsoil is dark brown. The lower part to a depth of 80 inches is black, and organic coatings are on most of the sand grains.

Mandarin soils are somewhat poorly drained. Typically, the surface layer is black fine sand about 5 inches thick. The subsurface layer, to a depth of 28 inches, is light gray fine sand. The upper part of the subsoil, to a depth of 33 inches, is black fine sand. The sand grains are well coated with organic material. The next layers, to a depth of 60 inches, are dark brown, dark yellowish brown, and grayish brown fine sand. The lower part to a depth of 80 inches is black loamy fine sand. The sand grains are coated with organic matter.

Pottsburg soils are poorly drained. Typically, the surface layer is very dark gray fine sand about 7 inches thick. The subsurface layer, to a depth of about 43 inches, is gray and grayish brown fine sand. The upper part of the subsoil, to a depth of 53 inches, is very dark gray fine sand. The lower part to a depth of 80 inches is black fine sand. The sand grains in the subsoil are well coated with organic material.

The minor soils in this map unit are Allanton, Centenary, Hurricane, Lynn Haven, Osier, Solite, Neilhurst, Rutlege, and Sapelo soils. Allanton, Osier, and Rutlege soils are in small depressions, swamps, and drainageways. Centenary and Hurricane soils are on the slight knolls. Lynn Haven and Sapelo soils are on the broad flatwoods. Solite and Neilhurst soils are reclaimed mined soils.

Most areas of this map unit are in woodland. Small areas have been cleared for pasture. A few areas are used for urban development.

The soils in this map unit have severe limitations for cropland. Wetness and droughtiness are the limiting factors. Most of these soils are well suited to pasture where drained.

Limitations affecting most urban uses are severe. The major limiting factor is wetness or the seasonal high water table. This problem should be overcome before urban development is undertaken.

8. Sapelo-Meadowbrook-Leon

Nearly level, poorly drained soils that are sandy to a

depth of 40 to 79 inches; some have a loamy subsoil, some have a sandy subsoil that is underlain by a loamy subsoil, and some are sandy throughout and have a subsoil that is coated with organic matter

This map unit is mostly in the northern part of Clay County. One area of these soils is in the southeastern part. These soils are on the flatwoods. The mapped areas vary in shape and size.

This map unit makes up 27,762 acres, or about 7 percent of the county. It is about 51 percent Sapelo soils, about 21 percent Meadowbrook soils, about 10 percent Leon soils, and about 28 percent soils of minor extent.

The landscape is nearly level pine and saw palmetto flatwoods interspersed with cypress ponds, drainageways, and small, grassy, wet depressions.

The natural vegetation on the flatwoods is mixed longleaf pine, slash pine and a few loblolly pine. The understory vegetation is mainly saw palmetto, gallberry, running oak, dwarf huckleberry, waxmyrtle, pineland threeawn, bluestem, and lichens. The vegetation in the ponds, depressions, and drainageways is mainly bay, cypress, and gum trees and water-tolerant grasses.

Typically, the surface layer of Sapelo soils is very dark gray fine sand about 8 inches thick. The subsurface layer, to a depth of 16 inches, is light gray fine sand. The upper part of the subsoil, to a depth of 21 inches, is black fine sand with organic coatings on the sand grains. The next layer, to a depth of 29 inches, is dark reddish brown fine sand. Below that layer, to a depth of 49 inches, is a leached layer of light gray fine sand. The next layer, to a depth of 53 inches, is light brownish gray sandy clay loam that has brownish yellow mottles. The lower part to a depth of 80 inches is light brownish gray sandy loam that has light gray mottles.

Typically, the surface layer of Meadowbrook soils is very dark gray sand about 7 inches thick. The subsurface layer, to a depth of 42 inches, is gray sand. The subsoil to a depth of 80 inches is gray and light gray sandy loam.

Typically, the surface layer of Leon soils is very dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of about 16 inches, is light gray fine sand. The subsoil is fine sand. The upper part, to a depth of 20 inches, is black. The sand grains are well coated with organic material. The next layer, to a depth of 26 inches, is very dark grayish brown. The sand grains are coated with organic material. Below that layer, to a depth of 67 inches, the subsoil is dark brown. The lower part to a depth of 80 inches is black, and organic coatings are on most of the sand grains.

The minor soils in this map unit are Albany, Allanton, Goldhead, Hurricane, Mandarin, Newnan, Osier, Pelham, Pottsburg, Rutlege, Surrency, and Wesconnett soils. Albany, Hurricane, Mandarin, Newnan soils are on slight knolls on the flatwoods. Allanton, Rutlege, Surrency, and Wesconnett soils are in the ponds, depressions, and drainageways. Goldhead, Osier, Pelham, and Pottsburg soils are on the broad flats and are intermixed with the major soils.

Most areas of this map unit are in natural vegetation. Most cleared areas are in pasture. Some areas are used for urban development.

The soils in this map unit have severe limitations for cropland. Wetness and droughtiness are the major limiting factors. If the soil and water are well managed, many crops that are commonly grown in the county are suited to these soils. Most of these soils are well suited to pasture where drained.

Limitations affecting urban uses are severe. Wetness is the major limiting factor. If these soils are used for urban development, a drainage system is needed to remove excess water during wet periods and to adequately control the high water table.

Soils in Swamps and Marshes and on the Flood Plains

The two general soil map units in this group consist of nearly level, poorly drained or very poorly drained mineral and organic soils that are subject to flooding or ponding. The soils in these map units are in the south-central part of the county. These soils are adjacent to the St. Johns River and along Black Creek, Little Black Creek, and Yellow Water Creek.

9. Maurepas-Pamlico

Nearly level, very poorly drained, organic soils; some have organic material to a depth of more than 51 inches, and some have organic material to a depth of 16 to 51 inches that is underlain by a sandy material

The soils in this map unit are in swamps along the St. Johns River, in swamps adjoining the Black Creek, Yellow Water Creek, and Little Black Creek, and in a large swamp in the south-central part of Clay County.

This map unit makes up 10,953 acres, or about 3 percent of the county. It is about 39 percent Maurepas soils, about 37 percent Pamlico soils, and about 24 percent soils of minor extent.

The landscape is large, low-lying swamps. These areas contain organic material that is highly variable in depth. Most of these areas are under water for long periods.

The natural vegetation is swamp hardwoods that are mostly bay, black tupelo, tupelo gum, red maple, and ash and some cypress trees. The understory vegetation is dominantly maidencane, cattail, cordgrass, bullrush, buttonbush, elderberry, water hyacinth, arrowhead, and dollarwort.

Typically, the surface layer of Maurepas soils is muck about 66 inches thick. The upper part is black, the middle part is dark reddish brown, and the lower part is very dark grayish brown. The underlying material to a depth of 75 inches or more is gray fine sand.

Typically, the surface layer of Pamlico soils is muck about 38 inches thick. The upper part is dark brown, and the lower part is very dark gray. The underlying material to a depth of 75 inches or more is grayish brown fine sand.

The minor soils in this map unit are Leon, Osier, Pottsburg, Rutlege, Santee, and Surrency soils. Leon and Pottsburg soils are on the higher flats that surround the map unit. Osier soils are on the outer edges of the swamps. Rutlege, Santee, and Surrency soils are intermingled in the swamps.

This map unit is in natural vegetation. Most areas are used for wildlife refuge.

The soils in this map unit are not suited to crops or to improved pasture unless adequately drained. A water control system should be established and maintained. This requires an extensive system of dikes and canals. Some areas do not have adequate drainage outlets.

The limitations affecting urban uses are severe. Water stands on the surface much of the time unless the soils are drained. A drainage system is very expensive to establish and maintain. Some areas cannot be adequately drained because drainage outlets are not available. Even if drained, the organic material is subject to oxidation, and the soils will gradually subside.

10. Allanton-Rutlege-Osier

Nearly level, very poorly drained and poorly drained soils that are sandy throughout; some have a subsoil that is coated with organic matter at a depth of more than 50 inches

This map unit is throughout Clay County. These soils are in swamps and depressions and along drainageways and creeks. The mapped areas are mostly narrow and elongated in shape.

This map unit makes up 10,953 acres, or about 3 percent of the county. It is about 40 percent Allanton soils, about 32 percent Rutlege soils, about 8 percent Osier soils, and 10 percent soils of minor extent.

The landscape is nearly smooth to slightly undulating flood plains. The areas are interspersed with swamps, depressions, oxbows, slight knolls, or small bluffs adjoining the drainageways and creeks. Extreme variations in the water level of the creeks and river affect the water table.

The natural vegetation is mainly black tupelo, cypress, elm, red maple, holly, sweetgum, sweetbay, magnolia, water oak, and scattered pine. The understory vegetation includes poison ivy, greenbrier, dollarwort, smilax, panicum, a few palmetto, and some water-tolerant plants.

Allanton soils are very poorly drained. Typically, the surface layer is fine sand about 18 inches thick. The upper part is very dark gray. The lower part is very dark grayish brown. The subsurface layer is fine sand. The upper part, to a depth of 26 inches, is dark gray. The lower part, to a depth of 56 inches, is grayish brown. The subsoil is fine sand. The upper part, to a depth of 63 inches, is very dark grayish brown. The lower part to a depth of 80 inches is very dark gray. The sand grains in the subsoil are well coated with organic material.

Rutlege soils are very poorly drained. Typically, the surface layer is mucky fine sand about 23 inches thick. The upper part is black, and the lower part is very dark grayish brown. The underlying material is fine sand. The upper part, to a depth of 41 inches, is grayish brown. The next layer, to a depth of 48 inches, is gray. The lower part to a depth of 80 inches is light brownish gray.

Osier soils are poorly drained. Typically, the surface layer is very dark gray fine sand about 5 inches thick. The underlying material is fine sand. The upper part, to a depth of 16 inches, is dark grayish brown. The next layer, to a depth of 33 inches, is grayish brown with yellowish brown mottles. Below that layer, to a depth of 48 inches, the underlying material is light brownish gray with brownish yellow mottles. The next layer, to a depth of 62 inches, is gray with strong brown mottles. The lower part to a depth of 80 inches is dark grayish brown with gray mottles.

The minor soils in this map unit are Leon, Maurepas, Meadowbrook, Meggett, Ridgewood, Pamlico, Pottsburg, Sapelo, Santee, Surrency, and Wesconnett soils. Leon, Meadowbrook, Meggett, Pottsburg, and Sapelo soils are slightly higher on the landscape than the major soils, and they are poorly drained. These soils generally are not on the flood plains except for Meggett soils. Maurepas, Pamlico, Santee, Surrency, and Wesconnett soils are very poorly drained and are

intermixed with the major soils. Ridgewood soils are on slight knolls on the flood plains. They are subject to occasional flooding.

This map unit has been left in natural vegetation.

The soils in this map unit are not suitable for cultivation because of the hazard of flooding and the high water table. Where flooding is controlled and a drainage system installed, these soils are suitable for improved pasture.

Limitations affecting urban uses are severe. The hazard of flooding, the high water table, and slow internal drainage are some of the restrictive features of these soils.

Detailed Soil Map Units

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

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

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

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Blanton fine sand, 5 to 8 percent slopes, is one of several phases in the Blanton series.

Some map units are made up of two or more major soils. These map units are called soil complexes 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. Sapelo-Urban land complex 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. Allanton and Rutlege mucky fine sands, depressional, is an undifferentiated group in this survey area.

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

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

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

Soil Descriptions

1—Albany fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and is somewhat poorly drained. It is along the lower slopes of broad, low ridges and on slight knolls between the many small streams in the county. The mapped areas are irregular in shape or elongated and mostly range from 25 to 150 acres. The slopes generally are convex.

Typically, this soil has a surface layer of very dark gray fine sand about 6 inches thick. The subsurface layer, to a depth of 47 inches, is brown, very pale

brown, and light gray mottled fine sand. The upper part of the subsoil, to a depth of 60 inches, is brownish yellow mottled fine sandy loam. The lower part to a depth of 80 inches is light gray sandy clay loam with mottles.

Included with this soil in mapping are small areas of Blanton, Hurricane, Meadowbrook, Ocilla, and Ridgewood soils. The included soils make up about 15 percent or less of the map unit.

This soil has a high water table at a depth of 12 to 30 inches for 1 to 4 months during most years. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly slash pine, loblolly pine, longleaf pine, water oak, live oak, laurel oak, and sweetgum. The understory is mainly waxmyrtle, greenbrier, devils walkingstick, bluestem, various panicums, pineland threeawn, toothachegrass, inkberry, and switchgrass.

This Albany soil has severe limitations for cultivated crops because of periodic wetness and droughtiness. During wet periods, the high water table will retard root development. A well designed, simple drainage system will help to eliminate this problem. With proper management and a water control system, the soil is suited to most locally grown crops. Management practices to obtain high yields should include close-growing, soil-improving crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. Soil blowing is a hazard if the surface is not protected, especially during dry periods. Conservation tillage helps to control erosion and conserve moisture.

This soil has slight limitations for pasture. It is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. For maximum yields, the soil requires regular applications of fertilizer and lime, and also grazing must be controlled.

This soil is moderately well suited to the production of loblolly, slash, and longleaf pines. Equipment use, seedling mortality, and plant competition are concerns in management. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. Controlling the growth of hardwood understory by chemical or mechanical methods will reduce plant competition. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland and woodland wildlife is fair. The potential as habitat for wetland wildlife is poor because of the absence of water areas that can produce vegetation that is desirable to wetland wildlife.

This soil has severe limitations as sites for dwellings without basements and small commercial buildings and as sites for septic tank absorption fields because of the depth of the water table during wet periods. Adding suitable fill material to help keep the high water table at an effective depth will help overcome the wetness limitation. If outlets are available, a surface drainage system can be installed.

Limitations affecting recreational development are severe. This soil has a sandy surface layer that causes trafficability problems. Soil blowing is a hazard during dry periods. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer help to overcome these problems.

This Albany soil is in capability subclass IIIe. The woodland ordination symbol for this soil is 11W.

2—Blanton fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and is moderately well drained. It is on slight knolls and ridges on the uplands. Most mapped areas range from 10 to 65 acres. The slopes are nearly smooth or convex.

Typically, this soil has a surface layer of dark grayish brown fine sand about 6 inches thick. The subsurface layer is fine sand. The upper part, to a depth of 20 inches, is very pale brown. The next layer, to a depth of 46 inches, is very pale brown. Light gray mottles are in the lower part of this layer. The lower part of the subsurface layer, to a depth of 58 inches, is very pale brown with brown mottles. The upper part of the subsoil, to a depth of 61 inches, is pale brown sandy clay loam. The lower part to a depth of 80 inches grades to light gray.

Included with this soil in mapping are small areas of Albany, Ocilla, Ortega, and Penney soils. The included soils make up about 20 percent or less of the map unit.

This soil has a water table at a depth of 60 to 72 inches for 1 to 3 months during most years. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly live oak, bluejack oak, turkey oak, southern red oak, water oak, sweetgum, laurelcherry, slash pine, loblolly pine, and longleaf pine. The understory is mainly lopsided indiangrass, hairy panicum, low panicum, greenbrier, hawthorn, persimmon, fringeleaf paspalum, hairy tickclover, dwarf huckleberry, chalky and creeping

bluestems, and pineland threeawn.

This Blanton soil has severe limitations for most cultivated crops because of droughtiness and rapid leaching of plant nutrients. Most locally grown crops are adapted to this soil. Management practices to ensure high yields should include close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. If water is readily available and the installation of an irrigation system is economically feasable, high-value crops should be irrigated. Soil blowing is a hazard if the surface is not protected, especially during dry periods. Conservation tillage helps to control erosion and conserve moisture.

This soil has slight limitations for pasture. It is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. For maximum yields, the soil requires regular applications of fertilizer and lime, and grazing must be controlled. Irrigation is generally necessary during dry periods for the production of shallow root pasture plants.

This soil is moderately well suited to the production of slash pine, loblolly pine, and longleaf pine. Equipment use, seedling mortality, and plant competition are concerns in management. The use of equipment with large tires or tracks can help overcome the equipment limitations that are caused by the loose, sandy surface of this soil. This soil is droughty, and seasonal dry periods and no available water in the root zone can cause excessive seedling mortality and reduce plant growth. Plant competition from hardwoods, mainly oaks, can be reduced by good site preparation, which includes chopping and the use of herbicides. Use of special planting stock that is larger than normal, or that is containerized, will reduce the rate of seedling mortality. Planting operations should be scheduled during periods when rainfall is heavier and more frequent to increase the rate of seedling survival and to increase plant growth. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil is fair as habitat for openland and woodland wildlife. The potential as habitat for wetland wildlife is very poor.

Limitations affecting dwellings without basements and small commercial buildings are only slight. Limitations affecting septic tank absorption fields are moderate because of the depth of the high water table during wet periods. Adding suitable fill material to help keep the high water table at an effective depth will help overcome the wetness limitation.

Limitations affecting recreational development are severe. The sandy surface layer causes trafficability problems, and soil blowing is a hazard. Establishing and maintaining good vegetation cover or windbreaks or adding topsoil or some other surface stabilizer help to overcome these problems.

This Blanton soil is in capability subclass IIIs. The woodland ordination symbol for this soil is 11S.

3—Hurricane fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and is somewhat poorly drained. It is on slight rises on the flatwoods and in the rather broad, transitional areas that are between the rolling uplands and the flatwoods in the county. The mapped areas are irregular in shape and range from 20 to 75 acres. The slopes generally are convex.

Typically, this soil has a surface layer of gray fine sand about 5 inches thick. The subsurface layer is fine sand. The upper part, to a depth of 10 inches, is brown. The next layer, to a depth of 29 inches, is very pale brown. The lower part, to a depth of 56 inches, is white. The subsoil is fine sand. The upper part, to a depth of 66 inches, is dark brown. The lower part to a depth of 80 inches is black.

Included with this soil in mapping are small areas of Albany, Blanton, Centenary, Leon, Mandarin, and Ortega soils. The included soils make up about 15 percent or less of the map unit.

This soil has a high water table at a depth of 24 to 40 inches for 3 to 6 months during most years. It may be at a depth of 10 to 24 inches for about 2 weeks or less during very wet periods and at a depth of more than 40 inches during dry periods. The available water capacity is low. The permeability is moderately rapid or rapid.

The natural vegetation is mainly slash pine, loblolly pine, longleaf pine, water oak, bluejack oak, post oak, and live oak. The understory is waxmyrtle, sumac, gallberry, saw palmetto, pineland threeawn, carpetgrass, and various bluestems and panicums.

This Hurricane soil has severe limitations for cultivated crops because of periodic wetness and droughtiness. During wet periods, the high water table can retard root development. With proper water control, the soil is suited to most locally grown crops. Management practices to ensure maximum yields should include close-growing, soil-improving cover crops in the crop rotation system, returning crop residue to the soil, and applying fertilizer and lime. Soil blowing is a hazard if the surface is not protected, especially during dry periods. Conservation tillage helps to control erosion and conserve moisture.

Figure 4.—This Hurricane fine sand, 0 to 5 percent slopes, in a pecan grove is well suited to pasture grasses and legumes if grazing is controlled.

This soil has slight limitations for pasture (fig. 4). It is well suited to bahiagrass, improved bermudagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. For maximum yields, this soil requires regular applications of fertilizer and lime, and grazing must be controlled.

This soil is moderately well suited to the production of slash and longleaf pines. Equipment use, seedling mortality, and plant competition are concerns in management. Use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. All plant debris should be left on

the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland wildlife is poor. The potential as habitat for woodland wildlife is fair; and for wetland wildlife, it is very poor.

Limitations affecting dwellings without basements and small commercial buildings are moderate because of the depth of the water table during wet periods. Limitations affecting septic tank absorption fields are severe. Adding suitable fill material to help keep the high water table at an effective depth will help overcome the wetness limitation. If outlets are available, a surface drainage system can be installed.

Limitations affecting recreational development are severe. The sandy surface layer causes trafficability problems and soil blowing is a hazard. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer help to overcome these problems.

This Hurricane soil is in capability subclass IIIw. The woodland ordination symbol for this soil is 11W.

4—Ocilla loamy fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and is somewhat poorly drained. It is in relatively small, slightly convex areas on the flatwoods and along the lower slopes of the gently rolling uplands. The mapped areas are irregular in shape and range from about 10 to 50 acres.

Typically, this soil has a surface layer of very dark grayish brown loamy fine sand about 6 inches thick. The subsurface layer is loamy fine sand. The upper part, to a depth of 11 inches, is yellowish brown. The lower part, to a depth of 27 inches, is very pale brown with brownish yellow mottles. The upper part of the subsoil, to a depth of 45 inches, is brownish yellow fine sandy loam that has red, brown, and gray mottles. The next layer, to a depth of 73 inches, is gray clay loam that has red and brown mottles. The lower part to a depth of 80 inches is mottled light gray, red, and brownish yellow fine sandy loam.

Included with this soil in mapping are small areas of Albany, Blanton, Pelham, and Plummer soils. Also included in some delineations are small areas of soils that have similar characteristics of Ocilla soil except the clay content in the subsoil decreases by more than 20 percent of its maximum within 60 inches of the surface. In places are a few small areas of soils that are similar to Ocilla soil but have 5 to 8 percent slopes. The included soils make up about 15 percent of the map unit.

This soil has a high water table at a depth of about 12 to 30 inches for 2 to 6 months during most years. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly slash pine, longleaf pine, loblolly pine, water oak, laurel oak, dogwood, and sweetgum. The understory is mainly waxmyrtle, wild grape, gallberry, dwarf huckleberry, toothachegrass, several varieties of bluestems, low panicum, blackberry, pineland threeawn, and creeping beggarweed.

This Ocilla soil has moderate limitations for cultivated crops. The major limitation is wetness. In the soil's natural condition, the crops that are best adapted are those that are tolerant of slightly wet conditions. Most of the locally grown crops are adapted to this soil but may need some drainage during extended wet periods for maximum yields. If water is readily available and the installation of an irrigation system is economically feasible, high-value crops should be irrigated during prolonged droughty periods. Management practices to ensure high yields should include close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. Conservation tillage helps to control erosion and conserve moisture.

This soil has slight limitations for pasture. It is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. For maximum yields, this soil requires regular applications of fertilizer and lime, and grazing must be controlled.

This soil is moderately well suited to the production of loblolly and slash pines. Equipment use, seedling mortality, and plant competition are concerns in management. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. Controlling the growth of hardwood understory by chemical or mechanical methods will reduce plant competition. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland wildlife is fair. The potential as habitat for woodland wildlife is good; and for wetland wildlife, it is fair.

Limitations affecting dwellings without basements are moderate. Limitations affecting septic tank absorption fields and small commercial buildings are severe because of the high water table and seepage. Adding suitable fill material to help keep the high water table at

an effective depth will help overcome the wetness limitation. If outlets are available, a surface drainage system can be installed.

Limitations affecting recreational development are moderate. The sandy surface layer may cause trafficability problems during dry periods because of soil blowing. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer help to overcome these problems.

This Ocilla soil is in capability subclass IIIw. The woodland ordination symbol for this soil is 11W.

5—Penney fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and is excessively drained. It is on the deep, sandy uplands. The mapped areas are irregular in shape and range from 15 to 300 acres. The slopes are nearly smooth to convex.

Typically, this soil has a surface layer of gray fine sand about 3 inches thick. The underlying material is fine sand. The upper part, to a depth of 17 inches, is brownish yellow. The next layer, to a depth of 45 inches, is yellow. Below that layer, to a depth of 57 inches, the underlying material is very pale brown. The lower part to a depth of 80 inches is very pale brown and has thin lamellae of yellowish brown loamy fine sand.

Included with this soil in mapping are some small areas of Albany, Blanton, Centenary, and Ortega soils. In a few places are small areas of Penney soils that have slope of 5 to 8 percent. The included soils make up about 15 percent or less of the map unit.

This soil has a water table at a depth of more than 72 inches. The available water capacity is very low. The permeability is rapid.

The natural vegetation is mainly turkey oak, bluejack oak, post oak, scrub live oak, and longleaf pine (fig. 5). The understory is mainly a sparse growth of pineland threeawn, indiangrass, chalky bluestem, and various panicums.

This Penney soil has very severe limitations for cultivated crops. It is unable to retain sufficient moisture during dry periods because of its coarse texture. Plant nutrients applied to the soil are rapidly leached. Corn, peanuts, and watermelons can be grown but require intensive management. Management practices to ensure high yields should include close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. Irrigation is needed during droughty periods. Soil blowing is a severe hazard if the surface is not protected, especially during dry periods.

This soil has moderate limitations for pasture. It is moderately suited to deep root bahiagrass and improved bermudagrass, but yields are generally reduced by periodic droughts. To maintain good grazing, careful pasture management is required. This includes establishing the proper plant population and applying fertilizer and lime, and grazing must be controlled. Irrigation will improve the quality of grazing and hay crops and, during long, dry periods, may be economically justifiable if water is readily available. This soil is not suited to shallow root pasture plants because it can not retain sufficient moisture in the root zone for good plant growth.

This soil is moderately suited to the production of slash pine, longleaf pine, and sand pine. Equipment use, seedling mortality, and plant competition are concerns in management. This soil is droughty and during long, dry periods does not retain enough moisture for plant growth. The use of special planting stock that is larger than usual, or that is containerized, will reduce the rate of seedling mortality. The use of equipment with large tires or tracks can help overcome the equipment limitations that are caused by the loose, sandy surface of this soil. Controlling the growth of hardwood understory by chemical or mechanical methods will reduce plant competition. All plant debris should be left on the site to help maintain the organic matter in the soil.

The potential of this soil as habitat for openland and woodland wildlife is poor. The potential as habitat for wetland wildlife is very poor because of the absence of water areas. This soil does not produce a suitable source of food for wetland wildlife.

Limitations affecting dwellings and small commercial buildings and septic tank absorption fields are slight; however, because of poor filtration, ground water contamination may be hazard in areas that have a concentration of houses with septic tank absorption fields.

Limitations affecting recreational development are severe. Because of the loose, sandy surface, maintaining good trafficability is a severe problem. Soil blowing is a hazard. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer help to overcome these problems.

This Penney soil is in capability subclass IVs. The woodland ordination symbol for this soil is 8S.

6—Mandarin fine sand. This soil is nearly level and somewhat poorly drained. It is in small to relatively large areas on slight rises on the flatwoods. The

Figure 5.—Natural regeneration of longleaf pine and turkey oak occurs on Penney fine sand, 0 to 5 percent slopes. This soil is moderately suited to commercial production of pine trees.

mapped areas are irregular in shape and range from 5 to 400 acres. The slopes are convex and range from 0 to 2 percent.

Typically, this soil has a surface layer of black fine sand about 5 inches thick. The subsurface layer, to a depth of 28 inches, is light gray fine sand. The upper part of the subsoil, to a depth of 33 inches, is black fine sand, and the sand grains are well coated with organic

material. The next layer, to a depth of 38 inches, is dark brown fine sand. Below that layer, to a depth of 50 inches, is dark yellowish brown fine sand. The next layer, to a depth of 60 inches, is grayish brown fine sand. The lower part to a depth of 80 inches is black loamy fine sand with organic coatings on the sand grains.

Included with this soil in mapping are small areas of Centenary, Hurricane, Leon, and Ortega soils. The included soils make up about 20 percent or less of the map unit.

This soil has a high water table at a depth of 18 to 40 inches for 2 to 6 months during most years. It is at a depth of more than 40 inches during most of the remainder of the year. The available water capacity is moderate. The permeability is moderate.

The natural vegetation is mainly slash pine, longleaf pine, post oak, live oak, and water oak. The understory is mainly greenbrier, saw palmetto, running oak, waxmyrtle, pineland threeawn, dwarf huckleberry, carpetgrass, and various bluestems and panicums.

This Mandarin soil has severe limitations for cultivated crops because of periodic wetness and droughtiness. During wet periods, the high water table will retard root development. A properly designed, simple drainage system will help eliminate this problem. With proper management and a water control system, most locally grown crops are adapted to this soil. Management practices to obtain high yields should include close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. Soil blowing is a hazard if the surface is not protected, especially during dry periods.

This soil has slight limitations for pasture. It is well suited to bahiagrass and improved bermudagrass. Quality grazing can be maintained on this soil with extensive management. Pasture management includes establishing the proper plant population and applying fertilizer and lime, and also grazing must be controlled.

This soil is moderately suited to the production of slash and longleaf pines. Equipment use, seedling mortality, and plant competition are concerns in management. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland and woodland wildlife is poor. The potential as habitat for wetland wildlife is very poor.

Limitations affecting dwellings without basements and small commercial buildings are moderate. Limitations affecting septic tank absorption fields are severe because of the depth of the water table during wet periods. Adding suitable fill material to help keep the high water table at an effective depth will help overcome the wetness limitation. If outlets are available, a surface drainage system can be installed.

Limitations affecting recreational development are severe. The sandy surface layer causes trafficability problems, and soil blowing is a hazard. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer helps to overcome these problems.

This Mandarin soil is in capability subclass VIs. The woodland ordination symbol for this soil is 8S.

7—Centenary fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and is moderately well drained. It is on slight rises on the broad flatwoods and along transitional areas on the uplands that are between the many small streams and creeks in the county. The mapped areas are irregular in shape and range from 20 to 85 acres. The slopes generally are convex.

Typically, this soil has a surface layer of very dark grayish brown fine sand about 5 inches thick. The subsurface layer is fine sand. The upper part, to a depth of 10 inches, is brown. The next layer, to a depth of 43 inches, is very pale brown with mottles. The lower part, to a depth of 54 inches, is light gray. The upper part of the subsoil, to a depth of 60 inches, is dark reddish gray fine sand. The lower part to a depth of 80 inches is dark reddish brown fine sand.

Included with this soil in mapping are small areas of Albany, Blanton, Ridgewood, and Ortega soils. The included soils make up about 15 percent or less of the map unit.

This soil has a high water table at a depth of 42 to 60 inches for 1 to 4 months during most years. During droughty periods, the water table is at a depth of more than 60 inches. The available water capacity is very low. The permeability is moderately rapid.

The natural vegetation is mainly slash pine, longleaf pine, loblolly pine, turkey oak, post oak, bluejack oak, live oak, and water oak. The understory is mainly native grasses.

This Centenary soil has severe limitations for most cultivated crops because of droughtiness and rapid

leaching of plant nutrients. Most locally grown crops are adapted to this soil. Management practices to ensure high yields should include close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. If water is readily available and the installation of an irrigation system is economically feasable, high-value crops should be irrigated. Soil blowing is a hazard if the surface is not protected, especially during dry periods. Conservation tillage helps to control erosion and conserve moisture.

This soil has slight limitations for pasture. It is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. For maximum yields, this soil requires regular applications of fertilizer and lime, and grazing must be controlled. Shallow-root pasture plants generally need irrigation during the dry periods.

This soil is moderately well suited to the production of slash pine, loblolly pine, and longleaf pine. Equipment use, seedling mortality, and plant competition are concerns in management. The use of equipment with large tires or tracks can help overcome the equipment limitations that are caused by the loose, sandy surface of this soil. This soil is droughty, and seasonal dry periods and no available water in the root zone can cause excessive seedling mortality and reduce plant growth. Plant competition from hardwoods, mainly oaks, can be reduced by good site preparation, which includes chopping and the use of herbicides. Use of special planting stock that is larger than normal, or that is containerized, will reduce the rate of seedling mortality. Planting operations should be scheduled during periods when rainfall is heavier and more frequent to increase the rate of seedling survival and to increase plant growth. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland wildlife and woodland wildlife is fair. The potential as habitat for wetland wildlife is very poor because of the absence of water areas.

Limitations affecting dwellings without basements and small commercial buildings are slight. Limitations affecting septic tank absorption fields are moderate. Suitable fill material may need to be added or land shaping may be necessary.

Limitations affecting recreational development are severe. The sandy surface layer causes trafficability problems, and soil blowing is a hazard. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer help to overcome these problems.

This Centenary soil is in capability subclass IIIs. The woodland ordination symbol for this soil is 11S.

8—Sapelo fine sand. This soil is nearly level and poorly drained. It is in small and large areas on the flatwoods. The mapped areas are irregular in shape and range from 10 to 350 acres. The slopes are smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark gray fine sand about 8 inches thick. The subsurface layer, to a depth of 16 inches, is light gray fine sand. The upper part of the subsoil, to a depth of 21 inches, is black fine sand with organic coatings on the sand grains. The next layer, to a depth of 29 inches, is dark reddish brown fine sand. Below that layer, to a depth of 49 inches, is a leached layer of light gray fine sand. The next layer, to a depth of 53 inches, is light brownish gray sandy clay loam that has brownish yellow mottles. The lower part to a depth of 80 inches is light brownish gray sandy loam that has light gray mottles.

Included with this soil in mapping are small areas of Albany, Leon, Meadowbrook, Newnan, Plummer, and Rutlege soils. The included soils make up about 20 percent or less of the map unit.

This soil has a high water table within 12 inches of the surface for 1 to 4 months during most years. During very dry periods, the water table recedes to a depth of more than 40 inches. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly slash pine, longleaf pine, loblolly pine, live oak, and water oak. The understory is saw palmetto, gallberry, pineland threeawn, huckleberry, waxmyrtle, fetterbush, and various bluestems and panicums.

This Sapelo soil has very severe limitations for cultivated crops because of wetness and droughtiness. The number of adapted crops that can be grown is limited unless water control measures are used. With proper water control, this soil is suitable for most locally grown crops. Special crops are better adapted to this soil than most of the general farm crops. A water control system is needed to remove excess water during wet periods and provide for subsurface irrigation during dry periods. Row crops should be planted in alternating strips with close-growing, soil-improving cover crops. Crop residue, including the residue of the soil-improving crops, should be returned to the soil. Rows should be bedded. Fertilizer and lime should be added according to the needs of the crop.

In its natural state, this soil has severe limitations for

pasture.With proper water control, the soil is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. A water control system is needed to remove excess surface water during long rainy periods. For maximum yields, irrigation is needed during dry periods for white clover or other adapted shallow-root pasture plants. Pasture management for a good vegetation cover and maximum productivity includes establishing the proper plant population and applying fertilizer and lime, and grazing must be controlled.

This soil is moderately suited to the production of slash pine, loblolly pine, and longleaf pine. Equipment use, seedling mortality, and plant competition are concerns in management. Seasonal wetness is the main limitation. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation and planting and harvesting operations should be scheduled during dry periods to also help overcome equipment limitations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil for use as habitat for openland, woodland, and wetland wildlife is fair.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe because of the depth of the high water table during wet periods. A drainage system is needed to remove the excess surface water during wet periods and to adequately control the water table. Adding suitable fill material to help keep the high water table at an effective depth will help overcome the wetness limitation.

Limitations affecting recreational development are severe. The high water table, which is at or near the surface during wet periods, is a major problem. A water control system is needed to improve this condition. Trafficability is a problem. Because of the loose, sandy surface during dry periods, soil blowing is a hazard. Maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer helps to overcome these problems.

This Sapelo soil is in capability subclass IVw. The woodland ordination symbol for this soil is 10W.

9—Leon fine sand. This soil is nearly level and poorly drained. It is in broad areas on the flatwoods. The mapped areas are irregular in shape or elongated and range from 10 to 100 acres. Slopes are smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of about 16 inches, is light gray fine sand. The subsoil is fine sand. The upper part, to a depth of 20 inches, is black. The sand grains are well coated with organic material. The next layer, to a depth of 26 inches, is very dark grayish brown with organic coatings on the sand grains. Below that layer, to a depth of 67 inches, the subsoil is dark brown. The lower part to a depth of 80 inches is black with organic coatings on most of the sand grains.

Included with this soil in mapping are small areas of Lynn Haven, Mandarin, Ona, Pottsburg, and Sapelo soils. Also included are soils that are similar to Leon soil, but they are very poorly drained and have a thicker surface layer. The included soils make up about 20 percent or less of the map unit.

This soil has a high water table at a depth of less than 12 inches for 1 to 4 months during most years. It recedes to a depth of more than 40 inches during very dry periods. The available water capacity is low. The permeability is moderate or moderately rapid.

The natural vegetation is mainly longleaf pine, slash pine, live oak, and water oak. The understory is saw palmetto, running oak, gallberry, waxmyrtle, huckleberry, pineland threeawn, bluestem, briers, brackenfern, and other native forbs and grasses.

This Leon soil has very severe limitations for cultivated crops because of wetness and droughtiness. The number of adapted crops that can be grown is limited unless water is controlled. A good water control system is needed to remove excess water in wet periods and provide for subsurface irrigation in dry periods. Row crops should be planted in alternate strips with close-growing, soil-improving crops. Crop residue, including the residue of the soil-improving crops, should be returned to the soil. Rows should be bedded. Fertilizer and lime should be added according to the needs of the crop. Special crops (fig. 6) are better adapted to this soil than most of the general farm crops. With proper water control, this soil is suitable for most locally grown crops.

In its natural state, this soil has severe limitations for pasture.With proper water control, it is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. A water control system is needed to remove excess surface water

Figure 6.—Special crops, such as blueberries, can be grown on Leon fine sand if excessive wetness is controlled. Bedding in rows helps to overcome this wetness limitation.

during long rainy periods. For maximum yields, irrigation is needed during dry periods for white clover or other adapted shallow-root pasture plants. Pasture management for good vegetation cover and maximum productivity includes establishing the proper plant population and applying fertilizer and lime, and also grazing must be controlled.

This soil is moderately suited to the production of slash pine and longleaf pine. Equipment use, seedling mortality, and plant competition are concerns in management. Seasonal wetness is the main limitation. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation and planting and harvesting operations should be scheduled during dry periods to also help overcome the equipment limitations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland wildlife and woodland wildlife is fair. The potential as habitat for wetland wildlife is poor.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe because of the depth of the high water table during wet periods. A drainage system is needed to remove the excess surface water during wet periods and to adequately control the high water table. Adding

suitable fill material to help keep the high water table at an effective depth will help overcome the wetness limitation.

Limitations affecting recreational development are severe. The high water table, which is at or near the surface during wet periods, is a major problem. A water control system is needed to improve this condition. Trafficability is a problem. Because of the loose, sandy surface during dry periods, soil blowing is a hazard. Maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer helps to overcome these problems.

This Leon soil is in capability subclass IVw. The woodland ordination symbol for this soil is 8W.

10—Ortega fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and is moderately well drained. It is on slightly convex slopes on the broad flatwoods and along gentle slopes in the deep, sandy areas on the rolling uplands. The mapped areas generally are irregular in shape and range from 10 to 75 acres.

Typically, this soil has a surface layer of dark grayish brown fine sand about 3 inches thick. The underlying material is fine sand. The upper part, to a depth of 18 inches, is very pale brown. The next layer, to a depth of 62 inches, is yellow with mottles. The lower part to a depth of 80 inches is white with mottles.

Included with this soil in mapping are small areas of Albany, Blanton, Centenary, Hurricane, Penney, and Ridgewood soils. The included soils make up about 15 percent or less of the map unit.

This soil has a high water table at a depth of 40 to 60 inches for cumulative periods of 6 to 8 months during most years. It is at a depth of more than 60 inches during droughty periods. The available water capacity is very low. The permeability is rapid.

The natural vegetation is mainly slash pine, longleaf pine, loblolly pine, turkey oak, post oak, and bluejack oak. The understory is mainly pineland threeawn, toothachegrass, switchgrass, and various bluestems and panicums.

This Ortega soil has severe limitations for most cultivated crops because of droughtiness and rapid leaching of plant nutrients. Management practices to ensure high yields should include planting row crops in alternate strips with close-growing cover crops, including close-growing, soil-improving cover crops in the rotation system at least two-thirds of the time, returning crop residue to the soil, and applying fertilizer and lime. Because of the low available water capacity of the soil, droughtiness in the root zone is a problem during dry periods. If water is readily available and the installation of an irrigation system is economically feasible, high value crops should be irrigated.

This soil has slight limitations for pasture. It is well suited to deep-root pasture plants, such as bahiagrass and bermudagrass. Good quality pasture grass can be grown with proper management. For maximum yields, this soil requires proper applications of fertilizer and lime, and grazing must be controlled. Supplemental irrigation is beneficial during dry periods.

This soil is moderately suited to the production of slash and longleaf pines. Equipment use, seedling mortality, and plant competition are concerns in management. The use of equipment with large tires or tracks can help overcome the equipment use limitations that are caused by the loose, sandy surface of the soil. This soil is droughty and during long, dry periods does not retain enough moisture for plant growth. Use of special planting stock that is larger than usual, or that is containerized, will help reduce the rate of seedling mortality. Planting operations should be scheduled during periods when rainfall is more frequent and heavier to increase the rate of seedling survival and to increase plant growth. Plant competition from hardwoods, mostly oaks, can be reduced by use of herbicides during site preparation. During site preparation and thinning and harvesting operations, most of the plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland wildlife and woodland wildlife is fair. The potential as habitat for wetland wildlife is very poor because of the absence of water areas.

Limitations affecting dwellings without basements and small commercial buildings are only slight. Limitations affecting septic tank absorption fields are moderate because of the depth of the high water table during wet periods. Adding suitable fill material to help keep the high water table at an effective depth will help overcome the wetness limitation.

Limitations affecting recreational development are severe. The sandy surface layer causes trafficability problems, and soil blowing is a hazard. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer help to overcome these problems.

This Ortega soil is in capability subclass IIIs. The woodland ordination symbol for this soil is 10S.

11—Allanton and Rutlege mucky fine sands, depressional. The soils in this map unit are nearly level

and very poorly drained. These soils are in depressional areas. The mapped areas are circular, elongated, or irregular in shape and range from 10 to 70 acres. The slopes are concave and range from 0 to 2 percent.

Allanton soil makes up about 40 to 55 percent of this map unit. Rutlege soil makes up about 35 to 40 percent. The included soils make up less than 20 percent of the map unit.

Typically, the upper part of the surface layer of this Allanton soil, to a depth of about 12 inches, is very dark gray mucky fine sand. The lower part, to a depth of 18 inches, is very dark grayish brown mucky fine sand. The upper part of the subsurface layer, to a depth of about 26 inches, is dark gray fine sand. The lower part, to a depth of 56 inches, is grayish brown fine sand. The upper part of the subsoil, to a depth of 63 inches, is very dark grayish brown fine sand. The lower part to a depth of 80 inches is very dark gray fine sand with organic coatings on the sand grains.

Typically, the upper part of the surface layer of this Rutlege soil, to a depth of about 12 inches, is black mucky fine sand. The lower part, to a depth of about 23 inches, is very dark grayish brown mucky fine sand. The underlying material is fine sand. The upper part, to a depth of 41 inches, is grayish brown. The next layer, to a depth of 48 inches, is light gray. The lower part to a depth of 80 inches is light brownish gray.

Included in mapping are some small areas of Leon, Plummer, Sapelo, and Surrency soils.

The soils in this map unit have a high water table within 12 inches of the surface for 6 to 12 months of the year. The surface generally is covered with water for 6 months or more. The available water capacity is moderate. The permeability is moderately rapid; however, because of a shallow water table, the internal drainage is slow.

The natural vegetation is mainly pondcypress, blackgum, sweetbay, red maple, and swamp tupelo. A few areas have a vegetation growth of water-tolerant grasses.

Under natural conditions, the soils in this map unit are not suited to cultivated crops, improved pasture, or pine tree production. Excessive wetness is the main limitation. Adequate water control systems are difficult to establish. Many areas are in isolated ponds or wet depressions that do not have suitable drainage outlets. If a drainage system can be established and maintained, good quality grass or grass-clover mixtures can be produced with proper pasture management.

The potential of these soils as habitat for openland and woodland wildlife is very poor. The ponded areas are not desirable to openland or woodland wildlife and attempts to effectively improve these conditions would be unsatisfactory. The potential as habitat for wetland wildlife is good.

The limitations affecting urban development are severe. Water on or near the surface most of the time and thick, sandy texture are the dominant features that severely restrict the soil for urban use. Drainage systems that adequately remove the water and effectively regulate the water table are expensive and difficult to establish and maintain. In most areas, suitable water outlets are not available. Even if adequate drainage systems were installed, maintenance would be a continuing problem. If these soils are used as sites for homes, small commercial buildings, or septic tank absorption fields, a suitable fill material must be added before development begins.

Limitations affecting recreational development are severe. The ponding condition and sandy texture are the major problems. Before the soils can be used for recreational development, a water control system must be installed. The addition of a suitable fill material is needed to improve trafficability and to raise the surface to prevent a continuing wetness problem.

The soils in this map unit are in capability subclass VIIw. The woodland ordination symbol for these soils is 2W.

12—Surrency fine sand, depressional. This soil is nearly level and very poorly drained. It is in shallow depressions and broad drainageways. The mapped areas generally are circular, and range from 10 to 40 acres. The slopes are concave and range from 0 to 1 percent.

Typically, the upper part of the surface layer of this soil is black fine sand about 6 inches thick. The lower part, to a depth of 12 inches, is very dark gray fine sand. The subsurface layer, to a depth of about 34 inches, is grayish brown fine sand. The subsoil is sandy clay loam. The upper part, to a depth of about 50 inches, is light brownish gray. The lower part to a depth of about 80 inches is light gray.

Included with this soil in mapping are small areas of Leon, Meggett, Pelham, Plummer, Rutlege, Santee, and Sapelo soils. The included soils make up about 20 percent or less of the map unit.

This soil has a high water table within 12 inches of the surface for about 6 months or more during most years. Water is on the surface for 4 months or more. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly pondcypress, swamp tupelo, loblolly pine, slash pine, pond pine, and

Figure 7.—Maidencane, a water-tolerant grass, can provide good grazing during dry periods in the marshy areas on Surrency fine sand, depressional.

sweetbay. Other water-tolerant hardwoods are in some areas, and water-tolerant grasses are in a few areas (fig. 7).

Under natural conditions, this Surrency soil is not suited to cultivated crops or improved pasture because of ponding. Adequate water control systems are difficult to establish in most areas because suitable drainage outlets are not available. If a water control system can be established and maintained, most locally adapted vegetable crops and grass or grass-clover mixtures can be successfully grown. The marshy areas naturally provide good, but seasonal, grazing.

With surface drainage and bedding in rows, this soil is moderately well suited to the production of loblolly and slash pines. This soil is naturally suited to cypress and hardwoods; however, harvesting and planting should be scheduled during extended dry periods. The major concern in management is wetness, which limits the use of heavy equipment on the soil. The high water table causes severe seedling mortality. Drainage outlets are generally not available in most areas.

The potential of this soil as habitat for openland and woodland wildlife is poor. The ponded areas are not desirable to openland or woodland wildlife, and attempts to effectively improve these conditions are generally unsatisfactory. The potential as habitat for wetland wildlife is fair.

This soil has severe limitations for urban use. The ponding condition and slow internal drainage are the dominant features that severely restrict the soil for urban use. Drainage systems that would adequately remove the water and effectively regulate the water

table are expensive and difficult to establish and maintain. In most areas, suitable outlets are not available. Sufficient amounts of suitable fill material should be added to alleviate the surface wetness problem before urban development begins.

Limitations affecting recreational development are severe. The ponding condition and sandy texture are the major problems. Before the soil can be used, a water control system must be installed. The addition of sufficient amounts of a suitable fill material are needed to improve trafficability and to raise the surface enough to prevent a continuing wetness problem.

This Surrency soil is in capability subclass VIw. The woodland ordination symbol for this soil is 11W.

13—Meggett fine sandy loam. This soil is nearly level and poorly drained. It is on broad, low-lying flats that generally are adjacent to drainageways. The mapped areas are irregular in shape and range from 15 to 100 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark brown fine sandy loam about 6 inches thick. The subsurface layer, to a depth of about 11 inches, is grayish brown fine sandy loam. The upper part of the subsoil, to a depth of about 23 inches, is gray clay loam. The next layer, to a depth of about 46 inches, is gray sandy clay. The lower part to a depth of 80 inches or more is light olive gray clay.

Included with this soil in mapping are small areas of Goldhead and Pelham soils. The included soils make up about 15 percent of the map unit.

This soil has a high water table at a depth of less than 12 inches for 2 to 5 months during most years. The available water capacity is moderate. The permeability is slow.

The natural vegetation is water oak, laurel oak, sweetgum, blackgum, red maple, waxmyrtle, scattered saw palmetto, and gallberry. The native grasses include lopsided indiangrass, various panicums and bluestems, and maidencane.

This Meggett soil has very severe limitations for cultivated crops. Wetness, clayey subsoil, and slow internal drainage are the major limitations, and they are very hard to overcome. Water control systems are difficult to establish and maintain. Many areas do not have enough drainage outlets. The soil becomes waterlogged during wet periods because of the slow internal movement of water through the shallow, clayey subsoil. If an adequate water control system can be established and maintained, some vegetable crops can be grown.

In its natural state, this soil has severe limitations for pasture. With surface drainage, this soil is moderately suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. Because of slow internal drainage and because suitable drainage outlets are not available, the difficulty of establishing a good water control system is greatly increased. Good pasture management to obtain high yields includes establishing the proper plant population and applying fertilizer and lime, and also grazing must be controlled.

This soil is well suited to the production of loblolly and slash pines. Equipment use, seedling mortality and plant competition are concerns in management. During rainy periods, a high water table causes severe seedling mortality. Special site preparation, such as bedding in rows, furrowing, or surface drainage, will help establish seedlings, increase early growth, and decrease the rate of seedling mortality. The seasonal high water table is a limitation affecting the use of equipment. Site preparation and planting, thinning, and harvesting operations should be scheduled during dry periods. Field machinery equipped with large tires or tracks permits forest management operations to be performed during wet periods. Site preparation, such as harrowing, chopping, or bedding, will help to control plant competition. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for wetland wildlife is good. Shallow water areas can be developed in these areas for wetland wildlife. The potential as habitat for openland wildlife is fair, and it is good for woodland wildlife.

Limitations affecting dwellings and small commercial buildings and septic tank absorption fields are severe. The high water table, high shrink-swell potential, and slow internal drainage are the major limitations. Adding suitable fill material to help keep the high water table at an effective depth will help overcome the wetness limitation. If drainage outlets are available, a surface drainage system can be installed.

Limitations affecting recreational development are severe. The high water table and the slow internal drainage are the major limiting factors. This soil is difficult to adequately drain because of the slow internal drainage, and sometimes suitable drainage outlets are not available.

This Meggett soil is in capability subclass IVw. The woodland ordination symbol for this soil is 13W.

14—Ortega-Urban land complex, 0 to 5 percent slopes. This map unit consists of nearly level to gently sloping, moderately well drained soil and areas of Urban land. This map unit is in most urban areas in the county. The mapped areas are irregular in shape and range from 15 to 65 acres.

About 50 to 85 percent of each delineation is open areas of Ortega soil that consist of vacant lots, lawns, parks, playgrounds, unpaved parking lots, or small garden areas. Because these areas are too small or too intermingled with areas of Urban land, it is not practical to map them separately at the selected scale. About 10 to 30 percent of the soils in these open areas has been modified by cutting, grading, and spreading of soil material during urban related construction and development.

About 15 to 50 percent of each delineation is Urban land, which consists of areas that are covered with buildings, streets, parking lots, sidewalks, and other structures. The Urban land part of this map unit generally is developed on Ortega fine sand.

Typically, the surface layer of Ortega soil is gray fine sand about 5 inches thick. The underlying material is fine sand. The upper part, to a depth of 15 inches, is yellowish brown. The next layer, to a depth of 46 inches, is brownish yellow. Below that layer, to a depth of 65 inches, is very pale brown with mottles. The lower part to a depth of 80 inches is white with mottles.

Included in mapping are small areas of Blanton, Centenary, Hurricane, and Penney soils. Also included are small areas of soils that are similar to Ortega soil but have slope of 5 to 8 percent.

This soil has a high water table at a depth of 40 to 60 inches for 4 to 6 months during most years. It is at a depth of more than 60 inches during droughty periods. The available water capacity is very low. The permeability is rapid.

The natural vegetation is mainly turkey oak, bluejack oak, post oak, slash pine, and longleaf pine. The understory is mainly lopsided indiangrass, hairy panicum, low panicum, greenbrier, persimmon, fringeleaf paspalum, hoary tickclover, dwarf huckleberry, chalky bluestem, creeping bluestem, and pineland threeawn.

The soils in this complex are suited to most lawn grasses and ornamental plants that are adapted to the area. If the surface is stabilized, these soils are also suited to most recreational uses.

This map unit has not been assigned to a capability subclass and has not been assigned a woodland ordination symbol.

15—Quartzipsamments, excavated. This map unit consists of excavated areas in which the soil material has been removed for road construction and for fill material in preparation of building sites. These excavations are locally known as borrow pits. Most mapped areas are about 5 to 40 acres and about 5 to 12 feet deep. Small excavations that are too small to delineate are shown by the standard pick and shovel symbol on the maps in the back of this publication.

Included with these soils in mapping are small, wet spots, eroded areas, and areas where recent silting and soil deposition has occurred.

In most of these areas, the soils have a water table at a depth of more than 60 inches. In some areas, the water table is at a depth of about 10 to 60 inches during wet periods.

Under present conditions, this map unit is not suitable for crops, improved pasture, urban development, or most recreational uses. If they were reshaped and vegetated to conform with existing landscapes, the potential for these uses would vary in accordance to the site location.

The potential of this map unit as wildlife habitat is mostly poor to fair. The potential as commercial woodland is variable.

This map unit has not been assigned to a capability subclass and has not been assigned a woodland ordination symbol.

16—Hurricane-Urban land complex, 0 to 5 percent slopes. This map unit consists of somewhat poorly drained soil and of areas of Urban land. This map unit is in most urban areas in the county. The mapped areas generally are elongated or irregular in shape and range from about 25 to 150 acres.

About 50 to 85 percent of each delineation is open areas of Hurricane soil that consist of gardens, vacant lots, lawns, parks, unpaved parking lots, or playgrounds. Because these areas are too small or too intermingled with areas of Urban land, it is not practical to map them separately at the selected scale. About 15 to 30 percent of the soil in these open areas has been modified by cutting, grading, and spreading of soil material during urban related construction and development.

About 15 to 50 percent of each delineation is Urban land, which consists of areas that are covered with buildings, streets, parking lots, sidewalks, and other structures. The Urban land part of this map unit generally is developed on Hurricane fine sand.

Typically, the surface layer of Hurricane soil is very

dark grayish brown fine sand about 7 inches thick. The subsurface layer is fine sand. The upper part, to a depth of 11 inches, is grayish brown. The next layer, to a depth of 25 inches, is pale brown. Below that layer, to a depth of 52 inches, the subsurface layer is light gray with mottles. The next layer to a depth of 80 inches is dark brown and dark reddish brown fine sand with organic coatings on the sand grains.

Included with this soil in mapping are small areas of Albany, Centenary, Mandarin, Leon, and Ortega soils.

This soil has a water table at a depth of 24 to 40 inches for 3 to 6 months during most years. The available water capacity is low. The permeability is rapid.

The soils of this complex are suited to most lawn grasses and most ornamental plants that are tolerant to slightly wet conditions. If the surface is stabilized, these soils are moderately well suited to recreational uses.

The soils in this map unit have not been assigned to a capability subclass and have not been assigned a woodland ordination symbol.

17—Plummer fine sand. This soil is nearly level and poorly drained. It is in small and large areas on the flatwoods. The mapped areas are irregular in shape and range from about 10 to 100 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark grayish brown fine sand about 7 inches thick. The upper part of the subsurface layer, to a depth of 24 inches, is grayish brown fine sand. The lower part, to a depth of 52 inches, is light brownish gray fine sand. The subsoil to a depth of 80 inches is gray, mottled sandy clay loam.

Included with this soil in mapping are small areas of Albany, Osier, Pelham, and Sapelo soils. Also included are a few areas of soils that have a sand surface layer. The included soils make up about 15 percent of the map unit.

This soil has a high water table within 12 inches of the surface for 1 to 4 months and at a depth of 12 to 40 inches for about 3 to 4 months during most years. During droughty periods, the water table is at a depth of more than 40 inches. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly slash pine, loblolly pine, longleaf pine, live oak, water oak, red maple, and sweetgum. The understory is dominantly gallberry, waxmyrtle, pineland threeawn, dwarf brackenfern, bluestem, and panicum.

This Plummer soil has very severe limitations for cultivated crops because of wetness and droughtiness. The number of adapted crops that can be grown is limited unless water is controlled. With proper water control, this soil is suitable for most locally grown crops. Special crops are better adapted to this soil than most of the general farm crops. A water control system is needed to remove excess water during wet periods and provide for subsurface irrigation during dry periods. Row crops should be planted in alternate strips with close-growing, soil-improving cover crops. Crop residue, including the residue of the soil-improving crops, should be returned to the soil. Rows should be bedded. Fertilizer and lime should be added according to the needs of the crop.

In its natural state, this soil has severe limitations for pasture. With proper water control, the soil is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. A water control system is needed to remove excess surface water during long rainy periods. For maximum yields, irrigation is needed during dry periods for white clover or other adapted shallow-root pasture plants. Pasture management for good vegetation cover and maximum productivity includes establishing the proper plant population and applying proper fertilizer and lime, and also grazing must be controlled.

This soil is moderately well suited to the production of slash pine, loblolly pine, and longleaf pine. Equipment use, seedling mortality, and plant competition are concerns in management. Seasonal wetness is the main limitation. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation and planting and harvesting operations should be scheduled during dry periods to also help overcome the equipment limitations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland, woodland, and wetland wildlife is fair.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe because of the depth of the high water table during wet periods. A drainage system is needed to remove the excess surface water during wet periods and to adequately control the water table. Adding suitable fill material to help keep the high water table at

an effective depth will help overcome the wetness limitation.

Limitations affecting recreational development are severe. The high water table and the loose, sandy surface texture are the main limitations. A drainage system is needed to rapidly remove excess water during rainy periods. Because of the loose, sandy surface during dry periods, soil blowing is a hazard. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other form of surface stabilizer help to overcome these problems.

This Plummer soil is in capability subclass IVw. The woodland ordination symbol for this soil is 11W.

18—Ridgewood fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and is somewhat poorly drained. It is in relatively small areas on the broad flatwoods and along transitional areas on the uplands that are between the many small creeks and streams in the county. The mapped areas are irregular in shape and range from 15 to 80 acres. The slopes generally are convex.

Typically, this soil has a surface layer of dark gray fine sand about 5 inches thick. The underlying material is fine sand. The upper part, to a depth of 13 inches, is pale brown. The next layer, to a depth of 24 inches, is very pale brown with brownish yellow mottles. Below that layer, to a depth of 56 inches, the underlying material is light gray with mottles. The lower part to a depth of 80 inches is light gray.

Included with this soil in mapping are small areas of Albany, Hurricane, Ortega, Osier, and Plummer soils. The included soils make up about 15 percent of the map unit.

This soil has a high water table at a depth of 24 to 40 inches for 2 to 4 months during most years. During extreme wet periods, the high water table is at a depth of 15 to 24 inches for brief periods of less than 3 weeks. During dry periods, it is at a depth of more than 40 inches. The available water capacity is low. The permeability is rapid.

The natural vegetation is mainly slash pine, longleaf pine, water oak, laurel oak, southern red oak, and live oak. The understory is waxmyrtle, sumac, blackberry, gallberry, scattered saw palmetto, carpetgrass, pineland threeawn, and other native weeds and grasses.

This Ridgewood soil has severe limitations for cultivated crops because of periodic wetness and droughtiness. During wet periods, the high water table will retard root development. A properly designed, simple drainage system will help eliminate this problem. With proper management and a water control system, most locally grown crops are adapted to this soil. Management practices to ensure high yields should include close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. Soil blowing is a hazard if the surface is not protected, especially during dry periods.

This soil has slight limitations for pasture. It is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legumes mixtures can be grown with proper management. For maximum yields, this soil requires regular applications of fertilizer and lime, and grazing must be controlled.

This soil is moderately suited to the production of slash pine and longleaf pine. Equipment use, seedling mortality, and plant competition are concerns in management. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. All plant debris should be left on the site to help maintain the organic matter in the soil.

The potential of this soil as habitat for openland wildlife and woodland wildlife is fair. The potential as habitat for wetland wildlife is very poor.

Limitations affecting dwellings without basements and small commercial buildings are moderate, and limitations affecting septic tank absorption fields are severe because of the depth of the water table during wet periods. Adding suitable fill material to help keep the high water table at an effective depth will help overcome the wetness limitation. If outlets are available, a surface drainage system can be installed.

Limitations affecting recreational development are severe. The sandy surface layer causes trafficability problems, and soil blowing is a hazard. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer helps to overcome these problems.

This Ridgewood soil is in capability subclass IVs. The woodland ordination symbol for this soil is 10W.

19—Osier fine sand. This soil is nearly level and poorly drained. It is on poorly defined flats on the broad flatwoods and in shallow depressions on the sandy, rolling uplands. The shape of the areas is variable. The mapped areas range from 10 to 45 acres. On the broad flats, the slopes are nearly smooth; but in the shallow depressions, they generally are slightly concave. The

slopes range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark gray fine sand about 5 inches thick. The underlying material is fine sand. The upper part, to a depth of 16 inches, is dark grayish brown. The next layer, to a depth of 33 inches, is grayish brown with yellowish brown mottles. Below that layer, to a depth of 48 inches, the underlying material is light brownish gray with brownish yellow mottles. The next layer, to a depth of 62 inches, is gray with strong brown mottles. The lower part to a depth of 80 inches is dark grayish brown with gray mottles.

Included with this soil in mapping are small areas of Albany, Hurricane, Leon, Plummer, Ridgewood, and Rutlege soils. Also included are a few small areas of an Osier soil that is similar to this Osier fine sand, but it has 2 to 5 percent slopes. The included soils make up 15 percent or less of the map unit.

This soil has a high water table at a depth of less than 12 inches for 3 to 6 months during most years. The available water capacity is very low. The permeability is rapid.

The natural vegetation is mainly slash pine, loblolly pine, longleaf pine, sweetgum, water oak, laurel oak, black gum, sweetbay, and red maple. The understory is dominantly gallberry, waxmyrtle, pineland threeawn, dwarf huckleberry, brackenfern, and various bluestems and panicums. The vegetation in the slight depressional areas on the sandy uplands is mostly wetland grasses.

This Osier soil has very severe limitations for cultivated crops because of wetness and droughtiness. The number of adapted crops that can be grown is limited unless water is controlled. With proper water control, this soil is suitable for most locally grown crops. Special crops are better adapted to this soil than most of the general farm crops. A water control system is needed to remove excess water during wet periods and provide for subsurface irrigation during dry periods. Row crops should be planted in alternate strips with close-growing, soil-improving cover crops. Crop residue, including the residue of the soil-improving crops, should be returned to the soil. Rows should be bedded. Fertilizer and lime should be added according to the needs of the crop.

In its natural state, this soil has severe limitations for pasture. With proper water control, the soil is moderately well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with good management. A water control system is needed to remove excess water during long rainy periods. For best yields, irrigation is needed during dry periods for white clover or other adapted shallow-root pasture plants. Pasture management for a good vegetation cover and maximum productivity includes establishing the proper plant population and applying fertilizer and lime, and also grazing must be controlled.

This soil is moderately well suited to the production of slash pine, loblolly pine, and longleaf pine. Equipment use, seedling mortality, and plant competition are concerns in management. Seasonal wetness is the main limitation. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation and planting and harvesting operations should be scheduled during dry periods to also help overcome the equipment limitations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland wildlife and woodland wildlife is poor. The potential as habitat for wetland wildlife is fair.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe because of the depth of the high water table during wet periods. A drainage system is needed to remove the excess surface water during wet periods and to adequately control the high water table. Adding suitable fill material to keep the high water table at an effective depth will help overcome the wetness limitation.

Limitations affecting recreational development are severe. The high water table, which is at or near the surface during wet periods, and the loose, sandy surface texture are the main limitations. A water control system is needed to rapidly remove the excess water during rainy periods; however, when the soil is drained, the surface layer becomes dry and loose and causes severe trafficability problems and soil blowing. Windbreaks or a good vegetation cover or the addition of a suitable topsoil material or some other form of surface stabilization can be used to help overcome these problems.

This Osier soil is in capability subclass Vw. The woodland ordination symbol for this soil is 11W.

20—Scranton fine sand. This soil is nearly level and somewhat poorly drained. It is in relatively small areas on the broad flatwoods and along transitional areas

between the uplands and the many small creeks and streams in the county. The mapped areas are irregular in shape and range from 15 to 200 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark grayish brown fine sand about 9 inches thick. The underlying material is fine sand. The upper part, to a depth of 22 inches, is dark gray. The next layer, to a depth of 41 inches, is grayish brown. Below that layer, to a depth of 61 inches, the underlying material is light brownish gray. The lower part to a depth of 80 inches is light gray.

Included with this soil in mapping are small areas of Leon, Ona, Osier, Plummer, Ridgewood, Sapelo, and Rutlege soils. The included soils make up about 15 percent of the map unit.

This soil has a high water table at a depth of 6 to 18 inches for 3 to 6 months during most years. During dry periods, it is at a depth of more than 40 inches. The available water capacity is low. The permeability is rapid.

The natural vegetation is mainly slash pine, longleaf pine, sweetgum, and waxmyrtle.

This Scranton soil has severe limitations for cultivated crops because of periodic wetness and droughtiness. During wet periods, the high water table will retard root development. A properly designed, simple drainage system will help eliminate this problem. With proper management and a water control system, most locally grown crops are adapted to this soil. Management practices to ensure high yields should include close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. Soil blowing is a hazard if the surface is not protected, especially during dry periods. Conservation tillage helps to control erosion and conserve moisture.

This soil has slight limitations for pasture. It is well suited to bahiagrass, improved bermudagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. For maximum yields, this soil requires regular applications of fertilizer and lime, and grazing must be controlled.

This soil is moderately well suited to the production of longleaf pine, slash pine, and loblolly pine. Equipment use and plant competition are concerns in management. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Controlling the growth of hardwood understory by chemical or mechanical methods will reduce plant competition. Site preparation, such as harrowing and bedding, will help establish seedlings, increase early growth, reduce debris, control competing vegetation, and facilitate planting operations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland wildlife and woodland wildlife is fair. The potential as habitat for wetland wildlife is poor.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe because of the depth of the water table during wet periods. Adding suitable fill material to help keep the high water table at an effective depth will help overcome the wetness limitation. If outlets are available, a surface drainage system can be installed.

Limitations affecting recreational development are severe. The sandy texture and wetness are the major limitations. The sandy surface layer causes trafficability problems; and during dry periods, soil blowing is a hazard. Drainage and a water control system may be necessary to correct the wetness limitation. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer helps to overcome these problems.

This Scranton soil is in capability subclass IIIw. The woodland ordination symbol for this soil is 11W.

21—Goldhead fine sand. This soil is nearly level and poorly drained. It is on broad low-lying flats. The areas are irregular in shape and range from 10 to 80 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of black fine sand about 6 inches thick. The upper part of the subsurface layer, to a depth of 12 inches, is dark gray fine sand. The lower part, to a depth of 38 inches, is grayish brown fine sand. The upper part of the subsoil, to a depth of 45 inches, is light brownish gray sandy clay loam that has mottles. The lower part, to a depth of 51 inches, is gray fine sandy loam that has mottles. The substratum to a depth of 80 inches is gray fine sand and small pockets of fine sandy loam.

Included with this soil in mapping are small areas of Albany, Meggett, Ocilla, Osier, and Plummer soils. Also included are small areas of soils that have characteristics similar to Goldhead soil but have a very dark gray or black surface layer about 6 to 12 inches thick. The included soils make up about 15 percent or less of the map unit.

This soil has a high water table at a depth of less than 12 inches for 2 to 5 months during most years.

During droughty periods, it is at a depth of more than 40 inches. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly loblolly pine, slash pine, longleaf pine, sweetgum, laurel oak, water oak, baldcypress, cabbage palm, and blackgum. The understory is mainly gallberry, cabbage palmetto, waxmyrtle, briers, holly, and native grasses.

This Goldhead soil has very severe limitations for cultivated crops because of wetness and droughtiness. The number of adapted crops that can be grown is limited unless water is controlled. With proper water control, this soil is suitable for most locally grown crops. Special crops are better adapted to this soil than most of the general farm crops. A water control system is needed to remove excess water during wet periods and provide for subsurface irrigation during dry periods. Row crops should be planted in alternate strips with close-growing, soil-improving cover crops. Crop residue, including the residue of the soil-improving crops, should be returned to the soil. Rows should be bedded. Fertilizer and lime should be added according to the needs of the crop.

In its natural state, this soil has severe limitations for pasture. With proper water control, the soil is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. A water control system is needed to remove excess surface water during long rainy periods. For maximum yields, irrigation is needed during dry periods for white clover or other adapted shallow-root pasture plants. Pasture management for good vegetation cover and maximum productivity includes establishing the proper plant population and applying fertilizer and lime, and also grazing must be controlled.

This soil is moderately well suited to the production of slash pine, loblolly pine, and longleaf pine. Equipment use, seedling mortality, and plant competition are concerns in management. Seasonal wetness is the main limitation. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. Site preparation and planting and harvesting operations should be scheduled during dry periods to also help overcome the equipment limitations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland and woodland wildlife is fair. The potential as habitat for wetland wildlife is poor.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe because of the depth of the high water table during wet periods. A drainage system is needed to remove the excess surface water during wet periods and to adequately control the high water table. Adding suitable fill material to keep the high water table at an effective depth will help overcome the wetness limitation.

Limitations affecting recreational development are severe. The high water table, which is at or near the surface during wet periods, is the major limitation. A water control system should be installed. The sandy surface layer causes trafficability problems, and soil blowing is a hazard. Establishing and maintaining good vegetation cover or windbreaks and adding suitable topsoil or some other form of surface stabilizer help to overcome these problems.

This Goldhead soil is in capability subclass IIIw. The woodland ordination symbol for this soil is 10W.

22—Pelham fine sand. This soil is nearly level and poorly drained. It is in small and large areas on the flatwoods. The mapped areas are irregular in shape and range from 10 to 200 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark grayish brown fine sand about 4 inches thick. The upper part of the subsurface layer, to a depth of about 20 inches, is dark grayish brown fine sand. The lower part, to a depth of 26 inches, is light gray fine sand. The upper part of the subsoil, to a depth of 64 inches, is light gray and yellowish brown sandy clay loam that has mottles. The lower part to a depth of 80 inches is light gray very fine sandy loam that has mottles.

Included with this soil in mapping are small areas of Albany, Meadowbrook, Meggett, Ocilla, and Surrency soils. The included soils make up about 15 percent or less of the map unit.

This soil has a high water table at a depth of less than 12 inches for 1 to 4 months during most years. During droughty periods, it is at a depth of more than 40 inches. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly maple, slash pine, loblolly pine, longleaf pine, sweetgum, blackgum, and

water oak. The understory is mainly gallberry, waxmyrtle, briers, holly, and native grasses.

This Pelham soil has very severe limitations for cultivated crops because of wetness and droughtiness. The number of adapted crops that can be grown is limited unless water is controlled. With proper water control, this soil is suitable for most locally grown crops. Special crops are better adapted to this soil than most of the general farm crops. A water control system is needed to remove excess water during wet periods and provide for subsurface irrigation during dry periods. Row crops should be planted in alternate strips with close-growing, soil-improving cover crops. Crop residue, including the residue of soil-improving crops, should be returned to the soil. Rows should be bedded. Fertilizer and lime should be added according to the needs of the crop.

In its natural state, this soil has severe limitations for pasture. With proper water control, the soil is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. A water control system is needed to remove excess surface water during long rainy periods. For maximum yields irrigation is needed during dry periods for white clover or other adapted shallow-root pasture plants. Pasture management for good vegetation cover and maximum productivity includes establishing optimum plant population and applying fertilizer and lime, and also grazing must be controlled.

This soil is moderately well suited to the production of slash pine, loblolly pine, and longleaf pine. Equipment use, seedling mortality, and plant competition are concerns in management. Seasonal wetness is the main limitation. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation and planting and harvesting operations should be scheduled during dry periods to also help overcome the equipment limitations. Site preparation, such as harrowing and bedding, will help establish seedlings, control competing vegetation, and facilitate planting operations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland, woodland, and wetland wildlife is fair.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe because of the depth of the high water table during wet periods. A drainage system is needed to remove the excess surface water during wet periods and to adequately control the high water table. Adding suitable fill material to keep the high water table at an effective depth will help overcome the wetness limitation.

Limitations affecting recreational development are severe. The high water table, which is at or near the surface during wet periods, is the major limitation. A water control system should be installed. The sandy surface layer causes trafficability problems, and soil blowing is a hazard. Establishing and maintaining good vegetation cover or windbreaks and adding suitable topsoil or some other form of surface stabilizer help to overcome these problems.

This Pelham soil is in capability subclass IIIw. The woodland ordination symbol for this soil is 11W.

23—Sapelo-Urban land complex. This map unit consists of nearly level, poorly drained soil and of areas of Urban land. This map unit is in the urban areas of Orange Park, Middleburg, and Green Cove Springs. The mapped areas are elongated or irregular in shape and range from 15 to 120 acres. The slopes range from 0 to 2 percent.

About 50 to 85 percent of each delineation is open areas of Sapelo soil that consist of vacant lots, lawns, undeveloped parking areas, and playgrounds. Because these areas are too small or too intermingled with areas of Urban land, it is not practical to map them separately at the selected scale. About 5 to 20 percent of the soils in these open areas has been modified by cutting, grading, and spreading of soil material during urban related construction and development.

About 15 to 50 percent of each delineation is Urban land, which consists of areas that are covered with houses, streets, parking lots, sidewalks, industrial buildings, airports, and other structures. The Urban land part of this map unit generally is developed on Sapelo fine sand.

Typically, the surface layer of Sapelo soil is black fine sand about 4 inches thick. The subsurface layer is fine sand to a depth of 19 inches. The upper part is gray. The lower part is light gray. The upper part of the subsoil, to a depth of 24 inches, is black fine sand. The next layer, to a depth of 32 inches, is dark reddish brown fine sand. Below that layer, to a depth of 49 inches, is light brownish gray fine sand. The next layer, to a depth of 52 inches, is light gray sandy clay loam. The lower part to a depth of 80 inches is gray sandy clay loam.

Included in mapping are small areas of Albany, Hurricane, Leon, and Meadowbrook soils. The included

soils make up about 15 percent or less of the open areas in some delineations.

If not effected by drainage or fill material, the high water table is within 12 inches of the surface for 2 to 4 months during most years. During very dry periods, the water table recedes to a depth of more than 40 inches. The available water capacity is low. The permeability is moderate.

Open areas are suited to most lawn grasses, and many ornamental plants are adapted to this area. If a water control system is established and maintained, the area can also be used for recreation.

The soils in this map unit have not been assigned to a capability subclass and have not been assigned a woodland ordination symbol.

24—Urban land. In areas mapped as Urban land, 85 percent or more of the surface is covered by urban facilities, such as shopping centers, parking lots, buildings, streets, sidewalks, and related facilities. The natural soil cannot be observed. The few small, open areas in this map unit, such as parks and vacant lots, consist of Centenary, Hurricane, Ortega, Penney, Ridgewood, and Sapelo soils. Many of these open areas have been altered by cutting and shaping or by spreading fill material on the surface. The slopes range from 0 to 5 percent in most areas.

Included in mapping are small areas that are only about 55 to 85 percent covered by urban facilities. The included areas make up about 15 percent of the map unit.

This map unit has not been assigned to a capability subclass and has not been assigned a woodland ordination symbol.

25—Maurepas muck, frequently flooded. This soil is nearly level and very poorly drained. It is in wet marshes and swamps and in the wet flood plain areas of the larger streams in the county. The mapped areas mostly range from 10 to 100 acres and are somewhat circular or elongated. The slopes are nearly smooth to slightly concave and range from 0 to 1 percent.

Typically, the upper part of the surface layer of this soil is black muck about 6 inches thick. The next layer, to a depth of about 34 inches, is dark reddish brown muck. The lower part, to a depth of 66 inches, is very dark grayish brown muck. The underlying material to a depth of 75 inches or more is gray fine sand.

Included with this soil in mapping are some small areas of Pamlico, Rutlege, and Surrency soils. The included soils make up less than 20 percent of the map unit.

This soil generally has about 4 to 20 inches of water on the surface for about 6 months or more during most years. The high water table is within 12 inches of the surface for 6 to 12 months. The available water capacity is very high. The permeability is rapid.

The natural vegetation is swamp hardwoods (fig. 8) that consist mostly of sweetbay, blackgum, tupelo gum, red maple, pondcypress, and Carolina ash. The undergrowth is dominantly cordgrass, bullrush, buttonbush, elderberry, water hyacinth, arrowhead, and dollarwort.

Under natural conditions, this Maurepas soil is not suited to cultivated crops, improved pasture, or pine tree production. Not only is wetness that is caused by the ponding condition a very severe limitation, but drainage and water control are also severe limitations. Adequate water control systems are difficult to establish. The thick, organic material is poor support for the use of equipment. If a water control system can be established and maintained, most locally adapted vegetable crops and grass or grass-legume mixtures can be successfully grown.

The potential of this soil as habitat for wetland wildlife is good. This map unit has shallow water areas that are desirable to wetland wildlife. The potential as habitat for openland and woodland wildlife is very poor because the soil is too wet.

Limitations affecting urban use are severe. The high water table, ponding condition, excess humus, low soil strength, and potential for seepage are major problems that are hard to overcome. Proper drainage and water control systems require a major network of canals and ditches. Keeping the areas adequately drained would be a continuing problem. Even if drained, considerable subsidence of the organic layers will occur. This problem, along with unstable soil conditions, makes removal of this material and replacement with suitable fill material highly desirable before any urban development begins.

Limitations affecting recreational development are severe. The excessive humus and excessive wetness are the major limitations. Before the soil could be used for recreation areas, adequate drainage and a water control system would be necessary, but such systems would be very expensive to establish and maintain. When the soil is drained, the surface becomes dry and dusty. This dry, dusty condition and the unstable condition of the soil cause severe trafficability problems.

This Maurepas soil is in capability subclass VIIIw. The woodland ordination symbol for this soil is 2W.

27—Pamlico muck. This soil is nearly level and very

Figure 8.—This natural vegetation on Maurepas muck, frequently flooded, is swamp hardwoods. These shallow water areas provide good habitat for wetland wildlife.

poorly drained. This organic soil is in large and small swamps. The mapped areas are irregular in shape or elongated, and most mapped areas range from 20 to 300 acres. The slopes are smooth and range from 0 to 1 percent.

Typically, the upper part of the surface layer of this soil is dark brown muck. The lower part, to a depth of 38 inches, is very dark gray muck. The underlying material to a depth of 75 inches or more is grayish brown fine sand.

Included with this soil in mapping are small areas of Leon, Osier, Rutlege, and Surrency soils. These are mineral soils and generally are around the edges of the map unit. The included soils make up about 20 percent or less of the map unit.

This soil has 4 to 24 inches of water above the surface for 3 to 6 months during most years. The high water table is within 12 inches of the surface for most of the year except during long, extended dry periods. The available water capacity is very high. The permeability is moderate or moderately rapid.

The natural vegetation is mainly pondcypress and baldcypress. Blackgum, water tupelo, and red maple are in some areas, and water-tolerant grasses are in a few areas.

Under natural conditions, this Pamlico soil is not

suited to cultivated crops, improved pasture, or pine tree production. The excessive wetness and the problem of water control are the main limitations. Water is on the surface for much of the year. Adequate water control systems are difficult to establish. If a water control system can be developed and maintained, the soil is suited to crops and pasture plants that are somewhat tolerant to wet conditions. Most of the locally grown crops, including corn and soybeans, are adapted to this soil. Water-tolerant cover crops should be on the soil when regular crops are not being grown. Crop residue should be returned to the soil. Fertilizer and lime should be added according to the need of the crops.

The potential of this soil as habitat for wetland wildlife is good. These shallow water areas are desirable to wetland wildlife. The potential as habitat for openland and woodland wildlife is poor because the soil is too wet and does not produce a suitable source of food and cover.

Limitations affecting urban use are severe. The high water table, ponding condition, excess humus, low soil strength, and potential for seepage are major problems that are hard to overcome. Proper drainage and water control systems require a major network of canals and ditches. Keeping the areas adequately drained would be a continuing problem. In many areas, suitable drainage outlets are not available. The organic material is unstable; and, even when drained, subsidence will occur. This organic material should be removed and replaced with a suitable fill material before any urban development begins.

Limitations affecting recreational development are severe. The excessive wetness and excess humus are the major limitations. When the soil is drained, the exposed dry surface layer becomes dusty. This dry, dusty condition and the unstable condition of the soil cause severe trafficability problems.

This Pamlico soil is in capability subclass VIIw. The woodland ordination symbol for this soil is 2W.

28—Santee fine sandy loam, frequently flooded. This soil is nearly level and very poorly drained. It is in drainageways and on the river flood plains. The mapped areas range from about 10 to 40 acres and are elongated or irregular in shape. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of black fine sandy loam about 11 inches thick. The upper part of the subsoil, to a depth of 19 inches, is very dark gray clay loam. The next layer, to a depth of 30 inches, is dark gray clay loam. Below that layer, to a depth of 49 inches, is gray clay loam that has greenish gray mottles. The lower part, to a depth of 61 inches, is gray sandy clay loam that has greenish gray mottles. The substratum to a depth of 80 inches or more is greenish gray fine sandy loam.

Included with this soil in mapping are small areas of Goldhead, Meggett, Pelham, Plummer, Rutlege, and Surrency soils. Also included are soils that are similar to Santee soil but have a surface layer of mucky sand about 2 to 3 inches thick. The included soils make up about 15 percent of the map unit.

This soil has a high water table above or near the surface for as much as 6 months each year. Flooding occurs in most years. The available water capacity is moderate. The permeability is slow.

The natural vegetation is mainly sweetgum, willow oak, baldcypress, tupelo gum, and red maple. Water-tolerant grasses and shrubs or a mixture of hardwoods and grasses are in a few areas.

This Santee soil has very severe limitations for cultivated crops. Flooding, the restricted root zone, and slow internal drainage and surface drainage are major problems that are very hard to overcome. Adequate water control systems are hard to establish and maintain. In many areas, suitable drainage outlets are not available. The soil becomes waterlogged during wet periods because of the slow internal movement of water through the clayey subsoil. If water control systems can be established and maintained, some vegetable crops can be grown.

This soil has severe limitations for pasture. If flooding is controlled and drainage systems are installed and maintained, this soil is suitable for pasture. Because of the slow internal movement of water throughout the clayey subsoil and because suitable drainage outlets are not available, the possibility of establishing a water control system is decreased. Proper pasture management for maximum yields includes establishing the proper plant population and applying fertilizer and lime, and also grazing must be controlled.

Under natural conditions, this soil is not recommended for slash pine, loblolly pine, or longleaf pine because of excessive wetness. The potential of this soil for production of loblolly pine is very high if surface drainage is adequate and flooding is controlled. Equipment use, plant competition, and seedling mortality are concerns in management. The high water table and flooding are the major concerns in management and must be overcome to obtain maximum yields.

The potential of this soil as habitat for woodland and wetland wildlife is good. Shallow water areas can be

developed as habitat for wetland wildlife. The potential as habitat for openland wildlife is fair.

This soil is severely limited for urban uses, such as sanitary facilities and building site development, because of prolonged wetness and flooding.

Limitations affecting recreational development are severe mainly because of excessive wetness and flooding.

This Santee soil is in capability subclass VIw. The woodland ordination symbol for this soil is 8W.

29—Rutlege-Osier complex, frequently flooded. This map unit consists of nearly level, very poorly drained and poorly drained soils. These soils are interspersed across drainageways and river flood plains. The mapped areas are elongated and irregular in shape and range from about 50 to 500 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Rutlege mucky fine sand makes up about 40 to 55 percent of this map unit, and Osier fine sand makes up about 35 to 40 percent. The included soils make up about 5 to 25 percent. The individual areas of the soils in this map unit are too mixed or too small to map separately at the selected scale.

Rutlege soil is very poorly drained. Typically, this soil has a surface layer of black and very dark gray mucky fine sand about 14 inches thick. The underlying material is fine sand. The upper part, to a depth of 18 inches, is dark gray. The next layer, to a depth of 30 inches, is grayish brown mottled with light grayish brown. The lower part to a depth of 80 inches or more is light gray and light brownish gray.

Rutlege soil has a high water table within 12 inches of the surface for long periods during most years. Runoff is slow to ponded. Flooding occurs in most years. The available water capacity is low. The permeability is rapid.

Osier soil is poorly drained. Typically, this soil has a surface layer of very dark gray fine sand about 6 inches thick. The underlying material is fine sand. The upper part, to a depth of 32 inches, is dark grayish brown with yellowish brown mottles. The next layer, to a depth of 62 inches, is gray with brownish yellow mottles. The lower part to a depth of 80 inches is dark grayish brown.

Osier soil has a high water table within 12 inches of the surface for 3 to 6 months during most years and at a depth of less than 30 inches for cumulative periods of about 3 to 6 months or more. Flooding occurs in most years. The available water capacity is very low. The permeability is rapid.

Included in mapping are small areas of Maurepas and Pamlico mucks. Also included are other soils that are similar to Rutlege soil but have a thin layer of muck at a depth of about 30 to 40 inches.

The natural vegetation is mainly baldcypress, sweetgum, sweetbay, laurel oak, red maple, and water oak.

Because of prolonged wetness and flooding, the soils in this map unit are not suited to cultivated crops, improved pasture grasses, or pine tree production unless major drainage systems are developed. Because of flooding, a drainage system is difficult to establish and is expensive to maintain.

The potential of these soils as habitat for openland wildlife is poor. The potential of Rutlege soil as habitat for woodland wildlife is poor, and the potential of Osier soil is fair. The potential of these soils as habitat for wetland wildlife is fair.

Prolonged wetness is a severe limitation affecting the use of Rutlege and Osier soils as sites for houses, small commercial buildings, sanitary facilities, and recreational development. In addition, flooding is a severe hazard.

The soils in this map unit are in capability subclass Vw. The woodland ordination symbol for these soils is 7W.

30—Arents, sandy. These nearly level soils consist of material that has been reworked. They are the result of earthmoving operations. The mapped areas range from 10 to 40 acres. The slopes range from 0 to 2 percent.

Typically, the upper 2 to 3 feet of these soils is a mixture of sandy material interbedded with fragments or pieces of weakly cemented, sandy subsoil material. This material is underlain by large cells of garbage and refuse, which range from 2 to 20 feet in thickness. In some areas, this mixture of sandy material is used as a daily cover, and the garbage is in stratified layers in the sandy material.

Some areas of this map unit are in former pits, and others are constructed on the surface of undisturbed soils.

Included with these soils in mapping are areas that have been smoothed or have an uneven accumulation of general refuse on the surface.

These soils have a variable water table that is dependent upon the water table of the surrounding soils. It is estimated to be at a depth of 2 to 4 feet during wet periods in most areas. The available water capacity is variable but generally is very low or low. The permeability is variable but generally is rapid. The

content of organic matter is variable but generally very low or low.

These soils are not suited to cultivated crops.

For esthetic purposes, grasses or pine trees can be established with extensive woodland management; however, commercial production of pine trees generally is not practical. Slash pine and loblolly pine are the best trees to plant.

These soils have not been assigned to a capability subclass and have not been assigned a woodland ordination symbol.

31—Pottsburg fine sand. This soil is nearly level and poorly drained. It is in broad areas on the flatwoods. The mapped areas are irregular in shape or elongated and range from 10 to 100 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark gray fine sand about 7 inches thick. The subsurface layer is fine sand. The upper part, to a depth of 28 inches, is gray. The next layer, to a depth of 53 inches, is grayish brown. The upper part of the subsoil, to a depth of 63 inches, is very dark gray fine sand. The lower part to a depth of 80 inches is black fine sand. The sand grains in the subsoil are well coated with organic material.

Included with this soil in mapping are small areas of Hurricane, Leon, Osier, Plummer, Ridgewood, and Rutlege soils. Also included are soils that are similar to Pottsburg soil but have a stained layer at a depth of more than 50 inches. The included soils make up 20 percent or less of the map unit.

This soil has a high water table at a depth of less than 12 inches for 1 to 4 months during most years. It recedes to a depth of more than 40 inches during very dry periods. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly longleaf pine, slash pine, live oak, and water oak. The understory is mainly saw palmetto, running oak, gallberry, waxmyrtle, huckleberry, pineland threeawn, bluestem, briers, brackenfern, and other native forbs and grasses.

This Pottsburg soil has very severe limitations for cultivated crops because of wetness and droughtiness. The number of adapted crops that can be grown is limited unless excess water can be controlled. With proper water control, this soil is suitable for most locally grown crops. Special crops are better adapted to this soil than most of the general farm crops. A water control system is needed to remove excess water during wet periods and provide for subsurface irrigation during dry periods. Row crops should be planted in alternate strips with close-growing, soil-improving cover crops. Crop residue, including the residue of the soil-improving crops, should be returned to the soil. Rows should be bedded. Fertilizer and lime should be added according to the needs of the crop.

In its natural state, this soil has severe limitations for pasture.With proper water control, the soil is well suited to improved bermudagrass, bahiagrass, and legumes (fig. 9). Good quality pasture grass or grass-legume mixtures can be grown with proper pasture management. A water control system is needed to remove excess surface water during long rainy periods. For maximum yields, irrigation is needed during dry periods for white clover or other adapted shallow-root pasture plants. Pasture management for good vegetation cover and maximum productivity includes establishing a proper plant population and applying fertilizer and lime, and also grazing must be controlled.

This soil is moderately suited to the production of slash pine, loblolly pine, and longleaf pine. Equipment use, seedling mortality, and plant competition are concerns in management. Seasonal wetness is the main limitation. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation and planting and harvesting operations should be scheduled during dry periods to also help overcome the equipment limitations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland, woodland, and wetland wildlife is poor.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe because of the depth of the high water table during wet periods. A drainage system is needed to remove the excess surface water during wet periods and to effectively control the high water table. Adding suitable fill material to help keep the high water table at an effective depth will help overcome the wetness limitation.

Limitations affecting recreational development are severe. The high water table, which is at or near the surface during wet periods, is a major problem. A water control system is needed to improve this condition. Trafficability is a problem. Because of the loose, sandy surface during dry periods, soil blowing is a hazard. Maintaining good vegetation cover or windbreaks or

Figure 9.—This Pottsburg fine sand is well suited to improved pasture if excess water is controlled, proper management practices are applied, and grazing is controlled.

adding suitable topsoil or some other surface stabilizer helps to overcome these problems.

This Pottsburg soil is in capability subclass IVw. The woodland ordination symbol for this soil is 8W.

32—Blanton fine sand, 5 to 8 percent slopes. This soil is moderately sloping and moderately well drained. It is along the lower slopes on broad, low ridges that are adjacent to large and small streams in the county. The mapped areas are irregular in shape or elongated and range from 25 to 125 acres. The slopes generally are convex.

Typically, this soil has a surface layer of grayish brown fine sand about 6 inches thick. The subsurface layer, to a depth of 48 inches, is very pale brown mottled fine sand. The upper part of the subsoil, to a depth of 58 inches, is light yellowish brown mottled sandy loam. The next layer, to a depth of 71 inches, is light gray mottled sandy clay loam. The lower part to a depth of 80 inches is gray sandy clay loam.

Included with this soil in mapping are large areas of Albany soils and small areas of Meadowbrook, Ocilla, and Ridgewood soils. The included soils make up about 35 percent or less of the map unit.

This soil has a high water table at a depth of 30 to 48 inches for 1 to 4 months during most years. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly slash pine, loblolly pine, longleaf pine, water oak, live oak, laurel oak, and sweetgum. The understory is mainly waxmyrtle, greenbrier, devils walkingstick, bluestem, various panicums, pineland threeawn, toothachegrass, inkberry, and switchgrass.

This Blanton soil has severe limitations for most cultivated crops because of droughtiness and rapid

leaching of the nutrients. Most locally grown crops are adapted to this soil. Management practices to ensure high yields should include close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. If water is readily available and installation of an irrigation system is economically feasible, high value crops should be irrigated. Soil blowing is a hazard if the surface is not protected, especially during dry periods. Conservation tillage helps to control erosion and conserve moisture.

This soil has slight limitations for pasture. It is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-clover mixtures can be grown with proper management. For maximum yields, this soil requires regular applications of fertilizer and lime, and grazing must be controlled. Irrigation generally is necessary during the dry periods for the production of shallow root pasture plants.

This soil is moderately well suited to the production of slash pine, loblolly pine, and longleaf pine. Equipment use, seedling mortality, and plant competition are concerns in management. The use of equipment with large tires or tracks can help overcome equipment limitations that are caused by the loose, sandy surface of this soil. This soil is droughty, and seasonal dry periods and no available water in the root zone can cause excessive seedling mortality and reduce plant growth. Plant competition from hardwoods, mainly oaks, can be reduced by site preparation, which includes chopping and the use of herbicide. Use of special planting stock that is larger than normal, or that is containerized, will reduce the rate of seedling mortality. Planting operations should be scheduled during periods when rainfall is heavier and more frequent to increase the rate of seedling survival and to increase plant growth. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland and woodland wildlife is fair. The potential as habitat for wetland wildlife is poor because of the absence of water areas and vegetation that is desirable to wetland wildlife.

Limitations affecting dwellings and small commercial buildings and septic tank absorption fields are severe because of the depth of the water table during wet periods. Adding suitable fill material to keep the high water table at an effective depth will help overcome the wetness limitation.

Limitations affecting recreational development are severe. The sandy surface layer causes trafficability problems, and soil blowing is a hazard. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer help to overcome these problems.

This Blanton soil is in capability subclass IVs. The woodland ordination symbol for this soil is 11S.

34—Penney fine sand, 5 to 8 percent slopes. This soil is moderately sloping and excessively drained. It is in small areas on sharp breaking slopes paralleling drainageways and in relatively large areas on long, narrow slopes on the broad uplands. The mapped areas range from about 5 to 100 acres. The slopes are slightly convex in most areas.

Typically, this soil has a surface layer of gray fine sand about 3 inches thick. The underlying material is fine sand. The upper part, to a depth of 57 inches, is very pale brown. The lower part to a depth of 80 inches is very pale brown with thin lamellae of yellowish brown loamy fine sand.

Included with this soil in mapping are some small areas of Albany, Blanton, Centenary, and Ortega soils. The included soils make up about 15 percent or less of the map unit.

This soil has a water table at a depth of more than 72 inches. The available water capacity is very low. The permeability is rapid.

The natural vegetation is mostly turkey oak, bluejack oak, post oak, scrub live oak, and longleaf pine. The understory is mainly a sparse growth of pineland threeawn, indiangrass, chalky bluestem, and various panicums.

This Penny soil has very severe limitations for cultivated crops because of the very low available water capacity, steepness of slope, and possible hazard of erosion. This soil is unable to retain sufficient moisture during dry periods because of its coarse texture. Plant nutrients applied to the soil are rapidly leached. Corn, peanuts, and watermelons can be grown on this soil but require intensive management. Management practices to obtain maximum yields should include close-growing, soil-improving cover crops, returning crop residue to the soil, and applying proper fertilizer and lime. Irrigation is needed during droughty periods. The slope may cause some problems in the application of irrigation water. Soil blowing is a severe hazard if the surface is not protected, especially during dry periods.

This soil has moderate limitations for pasture. It is moderately suited to deep-rooted bahiagrass and improved bermudagrass, but yields are reduced by periodic droughts. To maintain proper grazing, careful pasture management is required. This includes

establishing the proper plant population and applying fertilizer and lime, and also grazing must be controlled. Irrigation is beneficial during dry periods. Shallow-root pasture plants are not suited to this soil because the soil cannot retain sufficient moisture in the root zone for good plant growth.

This soil is moderately suited to the production of slash pine, longleaf pine, and sand pine. Equipment use, seedling mortality, and plant competition are concerns in management. This soil is droughty and during long, dry periods does not retain enough moisture for plant growth. Use of special planting stock that is larger than usual, or that is containerized, will reduce the rate of seedling mortality. The use of equipment with large tires or tracks will help overcome the equipment limitations that are caused by the loose, sandy surface of this soil. Controlling the growth of hardwood understory by chemical of mechanical methods will reduce plant competition. All plant debris should be left on the site to help maintain the organic matter in the soil.

The potential of this soil as habitat for openland and woodland wildlife is poor. The potential as habitat for wetland wildlife is very poor because of the absence of water areas. This soil can not produce a suitable source of food for wetland wildlife.

Limitations affecting dwellings and local roads and streets are slight. Limitations affecting septic tank absorption fields are also slight; however, in areas that have a concentration of houses or other facilities using septic tank absorption fields, ground water contamination can be a hazard.

Limitations affecting recreational development are severe. Soil blowing and maintaining good trafficability are severe problems. Establishing and maintaining good vegetation cover or windbreaks or adding a suitable topsoil or some other surface stabilizer help to overcome these problems.

This Penney soil is in capability subclass VIs. The woodland ordination symbol for this soil is 8S.

36—Ortega fine sand, 5 to 8 percent slopes. This soil is moderately sloping and moderately well drained. It is in small areas on sharp breaking slopes paralleling drainageways and on long, narrow, irregular slopes on the broad uplands. The mapped areas range from about 5 to 90 acres. The slopes are slightly convex in most areas.

Typically, this soil has a surface layer of dark gray fine sand about 5 inches thick. The underlying material is fine sand. The upper part, to a depth of 62 inches, is very pale brown. The next layer, to a depth of 75 inches, is light brownish gray. The lower part to a depth of 80 inches is light gray.

Included with this soil in mapping are some small areas of Albany, Blanton, Centenary, Hurricane, Penney, and Ridgewood soils. The included soils make up about 15 percent or less of the map unit.

This soil has a high water table at a depth of 40 to 60 inches for cumulative periods of 6 to 8 months during most years. It is at a depth of more than 60 inches during droughty periods. The available water capacity is very low. The permeability is rapid.

The natural vegetation is mainly slash pine, longleaf pine, turkey oak, post oak, and bluejack oak. The understory is mainly pineland threeawn, toothachegrass, switchgrass, and various bluestems and panicums.

This Ortega soil has severe limitations for cultivated crops because of droughtiness, rapid leaching of nutrients, steepness of slope, and possible hazard of erosion. Management practices to ensure high yields should include planting on the contour, close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. If the installation of an irrigation system is economically feasible, high-value crops should be irrigated. Soil blowing is a hazard if the surface is not protected, especially during dry periods. Conservation tillage helps to control erosion and conserve moisture.

This soil has moderate limitations for pasture. It is well suited to deep-rooted pasture plants, such as bahiagrass and improved bermudagrass. Good quality pasture grass can be grown with proper management. For maximum yields, management should include regular applications of fertilizer and lime, and grazing must be controlled. Supplemental irrigation is beneficial during dry periods.

This soil is moderately suited to the production of slash and longleaf pines. Equipment use, seedling mortality, and plant competition are concerns in management. The use of equipment with large tires or tracks can help overcome equipment use limitations that are caused by the loose, sandy surface of the soil. This soil is droughty and during long, dry periods does not retain enough moisture for plant growth. Use of special planting stock that is larger than usual, or that is containerized, will reduce the rate of seedling mortality. Planting operations should be scheduled during periods when rainfall is more frequent and heavier to increase the rate of seedling survival and to increase plant growth. Plant competition from hardwoods, mostly oaks, can be reduced by use of herbicides during site preparation. During site preparation and thinning and

harvesting operations, most of the plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland and woodland wildlife is poor. The potential as habitat for wetland wildlife is very poor because of the absence of any water areas.

Limitations affecting dwellings and for local roads and streets are slight. Limitations affecting septic tank absorption fields are moderate because of wetness; however, in areas that have a concentration of houses or other facilities using septic tank absorption fields, ground water contamination can be a hazard.

Limitations affecting recreational development are severe. Soil blowing and maintaining good trafficability are severe problems. Establishing and maintaining good vegetation cover or windbreaks or adding a suitable topsoil or other surface stabilizer help to overcome these problems.

This Ortega soil is in capability subclass IVs. The woodland ordination symbol for this soil is 10S.

37—Ridgewood fine sand, 5 to 8 percent slopes. This soil is moderately sloping and somewhat poorly drained. It is in small, narrow areas adjacent to creeks and other drainageways in the county. The mapped areas are elongated and generally range from 5 to 50 acres. The slopes are concave.

Typically, this soil has a surface layer of very dark grayish brown fine sand about 4 inches thick. The underlying material is fine sand. The upper part, to a depth of 8 inches, is pale brown with yellow and white mottles. The next layer, to a depth of 36 inches, is very pale brown with light yellowish brown and white mottles. Below that layer, to a depth of 56 inches, it is very pale brown with brownish yellow mottles. The lower part to a depth of more than 80 inches is light gray with brownish yellow mottles.

Included with this soil in mapping are small areas of Albany, Hurricane, Ortega, Osier, and Plummer soils. Also included are a few small areas of soils that have 0 to 5 percent slopes. The included soils make up about 15 percent of the map unit.

This soil has a high water table at a depth of 24 to 40 inches for 2 to 4 months during most years. During extreme wet periods, the high water table rises to a depth of 15 to 24 inches for brief periods of less than 3 weeks. During dry periods, it is at a depth of more than 40 inches. The available water capacity is low. The permeability is rapid.

The natural vegetation is mainly slash pine, longleaf pine, water oak, laurel oak, southern red oak, and live oak. The understory is waxmyrtle, sumac, blackberry, gallberry, scattered saw palmetto, carpetgrass, pineland threeawn, and other native weeds and grasses.

This Ridgewood soil has severe limitations for cultivated crops because of periodic wetness and droughtiness. During wet periods, the high water table will retard root development. A properly designed, simple drainage system will help eliminate this problem. With proper management and a water control system, most locally grown crops are adapted to this soil. Management practices to ensure high yields should include close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. Soil blowing is a hazard if the surface is not protected, especially during dry periods.

This soil has slight limitations for pasture. It is well suited to bahiagrass, improved bermudagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. For maximum yields, this soil requires regular applications of fertilizer and lime, and grazing must be controlled.

This soil is moderately suited to the production of slash and longleaf pines. Equipment use, seedling mortality, and plant competition are concerns in management. Harrowing and bedding will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. The use of equipment with large tires or tracks can help overcome equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland wildlife and woodland wildlife is fair. The potential as habitat for wetland wildlife is very poor.

Limitations affecting dwellings without basements and small commercial buildings are moderate. Limitations affecting septic tank absorption fields are severe because of the depth of the water table during wet periods. Suitable fill material may be needed or land shaping may be necessary to keep the high water table at an effective depth and help overcome the wetness limitation.

Limitations affecting recreational development are severe. The sandy surface layer causes trafficability problems, and soil blowing is a hazard during dry periods. Establishing and maintaining good vegetation

cover or windbreaks or adding suitable topsoil or some other surface stabilizer help to overcome these problems.

This Ridgewood soil is in capability subclass IVs. The woodland ordination symbol for this soil is 10W.

38—Surrency fine sand, frequently flooded. This soil is nearly level and very poorly drained. It is in narrow to broad drainageways and on river flood plains. The mapped areas range from about 10 to 80 acres and are elongated or irregular in shape. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, the surface layer of this soil is fine sand. The upper part, to a depth of about 6 inches, is black, and the lower part, to a depth of 13 inches, is very dark gray. The subsurface layer, to a depth of 24 inches, is grayish brown fine sand. The subsoil to a depth of 80 inches is sandy clay loam. The upper part is light brownish gray. The lower part is gray.

Included with this soil in mapping are small areas of Osier, Pelham, Plummer, Rutlege, and Santee soils. Also included are soils that are similar to Surrency soil but have a surface layer of mucky sand about 2 to 3 inches thick. The included soils make up about 15 percent of the map unit.

This soil is flooded for very long periods during rainy seasons. When this soil is not flooded, it has a high water table within 12 inches of the surface for about 6 months or more during most years. Ponding occurs in the concave parts of the map unit. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly baldcypress. Water tupelo, loblolly pine, slash pine, pond pine, sweetbay, and other water-tolerant hardwoods are in some areas, and water-tolerant grasses are in a few areas.

This Surrency soil has very severe limitations for cultivated crops. Flooding, the restricted root zone, and drainage are major problems that are very hard to overcome. Adequate water control systems are hard to establish and maintain. In many areas, suitable drainage outlets are not available. If a water control system can be established, some vegetable crops can be grown on this soil.

This soil has severe limitations for pasture. If flooding is controlled and drainage systems are installed and maintained, this soil is suitable for pasture. Because suitable drainage outlets are not available, the possibility of establishing a good water control system is decreased. Good pasture management for maximum yields includes establishing the proper plant population and applying fertilizer and lime, and grazing must be controlled.

Under natural conditions, this soil is not recommended for slash pine, loblolly pine, or longleaf pine because of excessive wetness. The potential of this soil for production of slash pine is high if surface drainage is adequate and flooding is controlled. Equipment use, plant competition, and seedling mortality are concerns in management. The high water table and flooding are the major problems, which must be overcome to obtain maximum yields.

The potential of this soil as habitat for openland and woodland wildlife is poor. These flooded and ponded areas are not desirable to openland or woodland wildlife, and attempts to effectively improve these conditions are generally unsatisfactory. The potential as habitat for wetland wildlife is fair.

Limitations affecting urban use are severe. Flooding and ponding conditions and slow internal drainage are dominant features that need to be overcome before any urban development begins.

Limitations affecting recreational development are severe. The flooding and ponding conditions and sandy texture are major problems to overcome. A drainage system and flood control structures are needed to overcome flooding and ponding. In some cases, the addition of sufficient amounts of suitable fill material is also needed.

This Surrency soil is in capability subclass VIw. The woodland ordination symbol for this soil is 11W.

39—Meadowbrook sand, frequently flooded. This soil is nearly level and poorly drained. It is in drainageways. The mapped areas are elongated or irregular in shape and range from 50 to 500 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark gray to black sand about 8 inches thick. The upper part of the subsurface layer, to a depth of about 16 inches, is gray fine sand. The next layer, to a depth of 28 inches, is grayish brown fine sand. The lower part, to a depth of 43 inches, is gray fine sand. The subsoil to a depth of 80 inches or more is light gray or gray mottled sandy clay loam.

Included with this soil in mapping are Pamlico, Rutlege, and Surrency soils. These soils also are frequently flooded. Also included are a few areas of soils that have a subsurface layer that is stained by organic matter. The included soils make up about 15 percent of the map unit.

This soil is frequently flooded for periods of long duration. The floodwater may be as much as 2 feet deep. The high water table is within 12 inches of the

surface for most of the year except during long, extended dry periods. The available water capacity is low. The permeability is moderately slow.

The natural vegetation is mainly loblolly pine, slash pine, laurel oak, and sweetgum, and water oak. Water-tolerant grasses are in a few areas.

This Meadowbrook soil has severe limitations for cultivated crops. Flooding, the restricted root zone, and drainage are major problems that are very hard to overcome. Adequate water control systems are hard to establish and maintain. In many areas, suitable drainage outlets are not available. The soil becomes waterlogged during wet periods because of the slow internal movement of water through the clayey subsoil. If a water control system can be established, some vegetable crops can be grown on this soil.

This soil has severe limitations for pasture. If flooding is controlled and drainage systems are installed and maintained, this soil is suitable for pasture. Because suitable drainage outlets are not available, the possibility of establishing an effective water control system decreases. Proper pasture management for maximum yields includes establishing the proper plant population and applying fertilizer and lime, and also grazing must be controlled.

Under natural conditions, this soil is not recommended for slash pine, loblolly pine, or longleaf pine because of excessive wetness. The potential of this soil for production of loblolly pine is high if surface drainage is adequate and flooding is controlled. Equipment use, plant competition, and seedling mortality are concerns in management. The high water table and flooding are the major problems, which must be overcome to obtain maximum yields.

The potential of this soil as habitat for openland and woodland wildlife is poor. The areas are too wet and do not produce a good source of food and cover that is desirable to openland and woodland wildlife. The potential as habitat for wetland wildlife is good.

Limitations affecting urban use are severe. Flooding and wetness are dominant features that need to be overcome before any urban development begins.

Limitations affecting recreational development are severe. The flooding condition and sandy texture are the major problems to overcome. A drainage system and flood control structures are needed to overcome flooding. In some cases, the addition of sufficient amounts of a suitable fill material is also needed.

This Meadowbrook soil is in capability subclass VIw. The woodland ordination symbol for this soil is 10W.

40—Ousley fine sand, occasionally flooded. This soil is nearly level and somewhat poorly drained. It is on high and low terraces along streams on the flood plains. The mapped areas are elongated and irregular in shape and range from 15 to 50 acres. The slopes are convex and range from 0 to 2 percent.

Typically, the surface layer of this soil is dark gray fine sand. The upper part, to a depth of about 5 inches, is dark gray. The lower part, to a depth of 12 inches, is grayish brown. The underlying material is fine sand. The upper part, to a depth of 22 inches, is very pale brown. The next layer, to a depth of 39 inches, is light yellowish brown with reddish yellow mottles. Below that layer, to a depth of 61 inches, the underlying material is light brownish gray with reddish yellow mottles. The lower part to a depth of more than 80 inches is brown with faint very pale brown mottles.

Included with this soil in mapping are small areas of Albany, Hurricane, Leon, Ortega, and Osier soils. Also included are soils that have slopes that are steeper than 2 percent. The included soils make up about 15 percent of the map unit.

This soil has a high water table at a depth of 18 to 36 inches for 2 to 4 months during most years. Occasionally, rainfall over the watershed causes flooding, and if this occurs, the soil is covered with fast moving water for brief periods of 2 to 7 days. At all other times, the streams provide drainage for the soil (fig. 10). The available water capacity is very low. The permeability is rapid.

The natural vegetation is mainly slash pine, longleaf pine, water oak, laurel oak, and live oak. The understory is waxmyrtle, sumac, blackberry, gallberry, scattered saw palmetto, carpetgrass, pineland threeawn, and other native weeds and grasses.

This Ousley soil has severe limitations for cultivated crops because of flooding, periodic wetness, and droughtiness. During wet periods, the high water table will retard root development. A properly designed, simple drainage system will help eliminate this problem. With proper management, including water control, most locally grown crops are adapted to this soil. Management practices to ensure high yields should include close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. Soil blowing is a hazard if the surface is not protected, especially during dry periods. Conservation tillage helps to control erosion and conserve moisture.

This soil has severe limitations for pasture. With extensive management, bahiagrass and improved bermudagrass can be grown and quality grazing can be maintained. Pasture management includes establishing

Figure 10.—An area of Ousley fine sand, occasionally flooded, adjacent to and drained by one of the many streams in Clay County. This area of Ousley soil has been left in natural vegetation.

proper plant population and applying fertilizer and lime, and also grazing must be controlled.

This soil is moderately suited to the production of slash and longleaf pines. Equipment use, seedling mortality, and plant competition are concerns in management. Seasonal wetness is the main limitation. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. Site preparation and planting and harvesting operations should be scheduled during dry periods to also help overcome the equipment limitations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland wildlife and woodland wildlife is fair. The potential as habitat for wetland wildlife is very poor.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe because of flooding and the depth of the high water table during wet periods. The high, fluctuating water table and thick, sandy texture can also prevent adequate filtration of the effluent. Adding suitable fill material to keep the high water table at an

effective depth will help overcome the wetness limitation. The flood hazard should be carefully evaluated before using this soil for urban development.

Limitations affecting recreational development are severe because of occasional flooding and sandy texture. The sandy surface layer causes trafficability problems, and soil blowing is a hazard during dry periods. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer help to overcome these problems.

This Ousley soil is in capability subclass IIIs. The woodland ordination symbol for this soil is 10S.

41—Albany fine sand, 0 to 5 percent slopes, occasionally flooded. This soil is nearly level to gently sloping and somewhat poorly drained. It is in the higher areas on the flood plains. The mapped areas are small and irregular in shape or elongated and range from 5 to 55 acres. The slopes are convex.

Typically, this soil has a surface layer of very dark gray fine sand about 6 inches thick. The subsurface layer is fine sand. The upper part, to a depth of 13 inches, is brown. The next layer, to a depth of 29 inches, is pale brown. The lower part, to a depth of 47 inches, is gray with mottling. The upper part of the subsoil, to a depth of 60 inches, is brownish yellow mottled fine sandy loam. The lower part to a depth of 80 inches is light gray sandy clay loam that has reddish brown mottles.

Included with this soil in mapping are small areas of Blanton, Hurricane, Meadowbrook, Ocilla, and Ridgewood soils. These soils are occasionally flooded. The included soils make up about 15 percent or less of the map unit.

This soil has a high water table at a depth of 12 to 30 inches for 1 to 3 months during most years. The high water table is at a depth of 30 to 50 inches most of the time, and it is at a depth of more than 50 inches in dry periods. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly slash pine, loblolly pine, longleaf pine, water oak, live oak, laurel oak, and sweetgum. The understory is mainly waxmyrtle, greenbrier, devils walkingstick, bluestem, various panicums, pineland, threeawn, toothachegrass, gallberry, and switchgrass. Most areas are still in native vegetation. A few areas have been cleared and are in improved pasture.

This Albany soil has severe limitations for cultivated crops because of periodic wetness and droughtiness. In some years, crops may be damaged because of flooding. During wet periods, the high water table will retard root development. A properly designed, simple drainage system will help eliminate this problem. With proper management, including water control and flood protection, most locally grown crops are adapted to this soil. Management practices to ensure high yields should include close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. Soil blowing is a hazard if the surface is not protected, especially during dry periods. Conservation tillage helps to control erosion and conserve moisture.

This soil has slight limitations to use for pasture. It is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legumes mixtures can be grown with proper management. For maximum yields, this soil requires regular applications of fertilizer and lime, and also grazing should be controlled. Occasional flooding can damage the grass.

This soil is moderately well suited to the production of loblolly pine, slash pine, and longleaf pine. Equipment use, seedling mortality, and plant competition are concerns in management. The use of equipment with large tires or tracks can help overcome equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. Controlling the growth of hardwood understory by chemical or mechanical methods will reduce plant competition. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland and woodland wildlife is fair. The potential as habitat for wetland wildlife is poor because of the absence of water areas. This soil does not produce a suitable source of vegetation that is desirable to wetland wildlife.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields mainly are severe because of the possibility of flooding and depth of the high water table during wet periods. Adding suitable fill material to keep the high water table at an effective depth will help overcome the wetness limitation. The flood hazard should be carefully evaluated before using this soil for urban development.

Limitations affecting recreational development are severe. The sandy surface layer causes trafficability problems, and soil blowing is a hazard during dry periods. Flooding is a hazard for camp areas. Flooding must be controlled, and establishing and maintaining

good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer will help overcome these problems.

This Albany soil is in capability subclass IIIw. The woodland ordination symbol for this soil is 11W.

42—Osier fine sand, occasionally flooded. This soil is nearly level and poorly drained. It is on the flood plains. The mapped areas range from 10 to 100 acres and generally are elongated or irregular in shape. The slopes are slightly concave to convex and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark gray fine sand about 5 inches thick. The underlying material is fine sand. The upper part, to a depth of 18 inches, is dark grayish brown. The next layer, to a depth of 38 inches, is grayish brown. Below that layer, to a depth of 60 inches, the underlying material is light brownish gray. The lower part to a depth of 80 inches is light gray.

Included with this soil in mapping are small areas of Maurepas, Pamlico, Pelham, Plummer, Rutlege, and Surrency soils. Also included are soils that are similar to Osier soil but have a surface layer of mucky sand about 2 to 3 inches thick and have slopes up to 4 percent. The included soils make up about 15 percent of the map unit.

This soil has a high water table near the surface for as much as 6 months each year. Flooding occurs about every 2 years. The available water capacity is very low. The permeability is rapid.

The natural vegetation is pond pine, slash pine, loblolly pine, sweetgum, water oak, laurel oak, baldcypress, tupelo, blackgum, sweetbay, and red maple. The understory is dominantly gallberry, waxmyrtle, pineland threeawn, dwarf huckleberry, brackenfern, and various bluestems and panicums.

This Osier soil has very severe limitations for cultivated crops because of flooding, wetness, and droughtiness. Adapted crops that can be grown on this soil are limited. Special crops, which generally have more tolerance to wet conditions, need less space for root development, and require a shorter period to reach maturity, are generally better adapted to this soil than most of the general field crops. The high water table is difficult to control. In many areas, suitable drainage outlets are not available. With a water control system and intensive management, this soil will produce fair to good yields of most locally grown crops. The water control system should protect the area from flooding, remove excess water, and provide subsurface irrigation in dry periods. Row crops should be planted in alternate strips with close-growing, soil-improving cover crops in the rotation system. Crop residue, including that of the soil-improving crops, should be used to maintain organic matter content. Rows should be bedded. Fertilizer and lime should be added according to the needs of the crop.

In its natural state, this soil has severe limitations for pasture. With proper water control, the soil is moderately well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. A water control system is needed to remove excess water during long rainy periods. Pasture management for good vegetation cover and maximum productivity includes establishing the proper plant population and applying fertilizer and lime, and also grazing should be controlled.

This soil is moderately well suited to the production of slash pine, loblolly pine, and longleaf pine. Equipment use and seedling mortality are concerns in management. The potential of this soil for production of pines is attainable only in areas that have adequate surface drainage. Seasonal wetness and periods of drought require timely scheduling for site preparation and seedling planting. Site preparation includes bedding in rows. The use of equipment with large tires or tracks can help overcome the equipment limitations. All plant debris should be left on the site to help maintain the organic matter in the soil.

The potential of this soil as habitat for openland wildlife and woodland wildlife is poor. The potential as habitat for wetland wildlife is fair.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe because of the depth of the high water table during wet periods. A drainage system is needed to remove the excess surface water during wet periods and to adequately control the high water table. Adding suitable fill material to keep the high water table at an effective depth also will help overcome the wetness limitation. The flood hazard should be carefully evaluated before using this soil for urban development.

Limitations affecting recreational development are severe. Flooding, wetness, and the loose, sandy surface are the main problems. Flooding must be controlled, and a water control system is needed to rapidly remove intense, heavy rainwater; however, when the soil is drained, the surface layer becomes dry and loose and causes trafficability problems. During dry periods, soil blowing is a hazard. Windbreaks, good

vegetation cover, or a suitable topsoil fill material or some other surface stabilizer can be used to help overcome these problems.

This Osier soil is in capability subclass Vw. The woodland ordination symbol for this soil is 11W.

43—Pamlico muck, frequently flooded. This soil is nearly level and very poorly drained. This organic soil is on the flood plains. The mapped areas are irregular in shape or elongated and range from 50 to 500 acres. The slopes range from 0 to 1 percent.

Typically, the upper part of the surface layer of this soil is dark brown muck about 16 inches thick. The lower part, to a depth of 38 inches, is very dark gray muck. The underlying material to a depth of 75 inches or more is grayish brown fine sand.

Included with this soil in mapping are small areas of Maurepas, Osier, Rutlege, and Surrency soils. The included soils make up about 20 percent or less of the map unit.

This soil is frequently flooded for periods of long duration. Floodwater can be as much as 2 feet deep. The high water table is within 12 inches of the surface most of the year except during long, extended dry periods. The available water capacity is very high. The permeability is moderate or moderately rapid.

The natural vegetation is mainly baldcypress. Sweetbay, blackgum, and red maple also are in some areas, and water-tolerant grasses are in a few areas.

This Pamlico soil is not suited to cultivated crops, improved pasture, or pine tree production unless extensive drainage systems are established and maintained and flooding is controlled.

The potential of this soil as a habitat for wetland wildlife is good. These shallow water areas are desirable to wetland wildlife. The potential as openland and woodland wildlife is poor. This soil is too wet and does not produce a good source of food and cover desirable for openland or woodland wildlife.

Limitations affecting urban use are severe. The high water table, flooding condition, excess humus, low soil strength, and potential for seepage are major problems that are hard to overcome. Proper drainage and water control systems require a major network of canals and ditches. Keeping the areas adequately drained would be a continuing problem. In many areas, suitable drainage outlets are not available. The organic material is unstable, and, even if drained, subsidence will occur. This organic material should be removed and replaced with a suitable fill material before any urban development begins.

Limitations affecting recreational development are severe. The excessive wetness and excess humus are the major limitations. Drainage systems that would adequately remove the excess water is expensive to establish and maintain. When the soil is drained, the exposed dry surface layer becomes dusty. This condition and the unstable conditions of the soil cause severe trafficability problems.

This Pamlico soil is in capability subclass VIIw. The woodland ordination symbol for this soil is 7W.

46—Plummer fine sand, depressional. This soil is nearly level and very poorly drained. It is in wet, grassy depressional areas. The mapped areas are circular or irregular in shape and range from 5 to 60 acres. The slopes are concave and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark gray or black fine sand about 7 inches thick. The subsurface layer is fine sand. The upper part, to a depth of 25 inches, is light gray. The lower part, to a depth of 46 inches, is gray. The subsoil to a depth of 80 inches or more is light gray or gray mottled sandy clay loam.

Included with this soil in mapping are Pamlico, Pelham, Rutlege, and Surrency soils. Also included are a few areas of soils that have a stained subsurface layer. The included soils make up about 15 percent of the map unit.

Most areas of this soil are covered with water for 4 months or more. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly pondcypress, blackgum, sweetbay, swamp chestnut oak, pond pine, and swamp tupelo. Water-tolerant grasses are in a few areas.

Under natural conditions, this Plummer soil is not suited to cultivated crops, improved pasture, or pine tree production. The excessive wetness and the problem of water control are the main problems. Adequate water control systems are difficult to establish because most areas of this map unit are in isolated ponds or wet depressions that do not have suitable drainage outlets. If a drainage system can be established and maintained and with proper pasture management, good quality grass or grass-legume mixtures can be produced.

The potential of this soil as habitat for openland and woodland wildlife is poor. Ponding is not desirable to openland or woodland wildlife. The potential as habitat for wetland wildlife is good.

Limitations affecting urban use are severe. Water on or near the surface during much of the year and thick, sandy texture are the dominant features that severely

restrict the soil for this use. Drainage systems that would adequately remove the water and effectively regulate the high water table are expensive and hard to establish and maintain. Even if drainage systems are installed, keeping the area adequately drained would be a continuing problem. Before using as sites for dwellings and small commercial buildings and as septic tank absorption fields, suitable fill material must be added to the areas before any urban development begins.

Limitations affecting recreational development are severe. The ponding condition and sandy texture are the major concerns in management. Before the soil can be used for recreational areas, adequate drainage and a water control system must be established and maintained. The addition of a suitable fill material is needed to improve trafficability and to raise the surface sufficiently to prevent a continuing wetness problem.

This Plummer soil is in capability subclass Vw. The woodland ordination symbol for this soil is 2W.

47—Newnan fine sand. This soil is nearly level and somewhat poorly drained. It is in small to relatively large areas on low ridges on the flatwoods. The mapped areas are irregular in shape and range from about 5 to 400 acres. The slopes are nearly smooth to slightly convex and range from 0 to 2 percent.

Typically, this soil has a surface layer of black fine sand about 5 inches thick. The subsurface layer, to a depth of 19 inches, is gray and light gray fine sand. The upper part of the subsoil, to a depth of about 23 inches, is dark reddish brown fine sand, and the sand grains are well coated with organic material. The next layer, to a depth of 29 inches, is dark brown fine sand. Below that layer, to a depth of 51 inches, is a leached layer of brown to light gray fine sand. The lower part of the subsoil to a depth of 80 inches is light gray sandy clay loam that is mottled.

Included with this soil in mapping are some areas of Albany, Leon, Hurricane, Mandarin, and Sapelo soils. Also included are some areas of soils that have similar characteristics as Newnan soil except they have a Bh horizon at a depth of more than 30 inches. The included soils make up about 20 percent or less of the map unit.

This soil has a high water table at a depth of 18 to 30 inches for 1 to 2 months during most years, and it is at a depth of 30 to 60 inches for 2 to 5 months. During dry periods, it is at a depth of more than 60 inches. The available water capacity is low. The permeability is slow to moderately slow.

The natural vegetation consists mainly of longleaf pine, slash pine, and water oak. The understory is mainly running oak, saw palmetto, waxmyrtle, huckleberry, brackenfern, blueberry, briers, gallberry, various bluestems, and pineland threeawn.

This Newnan soil has severe limitations for cultivated crops because of periodic wetness and droughtiness. During wet periods, the high water table will retard root development. A properly designed, simple drainage system will help eliminate this problem. With proper management, including a water control system, most locally grown crops are adapted to this soil. Management practices to ensure optimum yields should include close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. Soil blowing is a hazard if the surface is not protected, especially during dry periods. Conservation tillage helps to control erosion and conserve moisture.

This soil has slight limitations for pasture. It is moderately well suited to bahiagrass, improved bermudagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. For maximum yields, this soil requires regular applications of fertilizer and lime, and also grazing must be controlled.

This soil is moderately suited to the production of slash, loblolly, and longleaf pines. Equipment use, seedling mortality, and plant competition are concerns in management. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. Controlling the growth of hardwood understory by chemical or mechanical methods will reduce plant competition. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland and woodland wildlife is poor. The potential as wetland wildlife is very poor.

Limitations affecting dwellings without basements and small commercial buildings are moderate. Limitations affecting septic tank absorption fields are severe because of the depth of the water table during wet periods. Adding suitable fill material to keep the high water table at an effective depth will help overcome the wetness limitation. If outlets are available, a surface drainage system can be installed.

Limitations affecting recreational development are severe. Trafficability is a problem. Because of the loose, sandy surface during dry periods, soil blowing is a

hazard. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer help to overcome these problems.

This Newnan soil is in capability subclass IIIs. The woodland ordination symbol for this soil is 10W.

49—Sapelo-Meadowbrook, frequently flooded, complex. This map unit consists of nearly level, poorly drained soils. These soils are interspersed along creeks and streams. Sapelo soil is on the higher flats. Meadowbrook soil is in well defined drainageways. The mapped areas are elongated and irregular in shape and range from 10 to 100 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Sapelo soil makes up about 40 to 55 percent of this map unit. Meadowbrook soil makes up about 25 to 40 percent. The included soils make up about 5 to 25 percent of the map unit.

Typically, the surface layer of Sapelo soil is black fine sand about 4 inches thick. The subsurface layer, to a depth of 18 inches, is light gray fine sand. The upper part of the subsoil, to a depth of 30 inches, is black to dark reddish brown fine sand. The next layer, to a depth of 34 inches, is yellowish brown fine sand that has few medium pale brown mottles. Below that layer, to a depth of 60 inches, is light brownish gray fine sand. The lower part to a depth of 80 inches or more is light gray sandy clay loam that has red and yellow mottles.

This Sapelo soil has a high water table within 12 inches of the surface for 2 to 4 months during most years. The available water capacity is low. The permeability is moderate.

Typically, the surface layer of Meadowbrook soil is very dark gray sand about 7 inches thick. The subsurface layer, to a depth of about 42 inches, is gray sand. The upper part of the subsoil, to a depth of about 70 inches, is gray sandy loam. The lower part to a depth of 80 inches is light gray sandy loam.

This Meadowbrook soil has a high water table within 12 inches of the surface most of the year except during long, extended dry periods. This soil is frequently flooded for periods of long duration. The floodwater can be as much as 2 feet deep. The available water capacity is low. The permeability is moderately slow.

Included in mapping are Pamlico, Rutlege, and Surrency soils. These soils are frequently flooded.

The natural vegetation is mainly slash pine, laurel oak, red maple, sweetgum, and water oak.

Because of prolonged wetness and flooding, Meadowbrook soil is not suited to cultivated crops or improved pasture grasses unless drainage systems are developed. Sapelo soil is better suited to cultivated crops and improved pasture grasses than Meadowbrook soil, but surface drainage is needed.

The soils in this map unit are moderately suited to the production of slash and loblolly pines. Equipment use, seedling mortality, and plant competition are concerns in management. Seasonal wetness is the main limitation. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. Site preparation and planting and harvesting operations should be scheduled during dry periods to also help overcome equipment limitations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

Meadowbrook soil is not suited to the production of pine trees unless surface drainage is adequate and seedbed preparation includes bedding in rows.

The potential of these soils as habitat for openland, woodland, and wetland wildlife is fair.

Flooding, the high water table, and the sandy texture severely limit the use of these soils for building sites and sanitary facilities.

Flooding is a hazard, and the high water table is a severe limitation affecting recreational development. The high water table must be maintained at an effective depth, and flooding must be controlled. A water control system must be established to improve these conditions. Trafficability is a problem. Because of the loose, sandy surface during dry periods, soil blowing is a hazard. Maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer helps to overcome these problems.

The soils in this map unit are in capability subclass VIw. The woodland ordination symbol for these soils is 10W.

50—Leon fine sand, frequently flooded. This soil is nearly level and poorly drained. It is on the flood plains. The mapped areas are irregular in shape or elongated and range from 10 to 90 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of black fine sand about 4 inches thick. The subsurface layer, to a depth of about 16 inches, is gray fine sand. The subsoil is fine sand. The upper part of the subsoil, to a depth of 26 inches, is black. The next layer, to a depth of 54 inches, is dark brown. The lower part to a depth of 80

inches is black. The sand grains in the subsoil are well coated with organic material.

Included with this soil in mapping are small areas of Lynn Haven, Mandarin, Ona, Pottsburg, and Sapelo soils. Also included are soils that are similar to Leon soil but are very poorly drained and have a thicker surface layer. The included soils make up about 20 percent or less of the map unit.

This soil has a high water table at a depth of less than 12 inches for 1 to 4 months during most years. It recedes to a depth of more than 40 inches during very dry periods. The available water capacity is low. The permeability is moderate or moderately rapid.

The natural vegetation is mainly longleaf pine and slash pine. The understory is saw palmetto, running oak, gallberry, waxmyrtle, huckleberry, pineland threeawn, bluestem, briers, brackenfern, and other native forbs and grasses.

This Leon soil has very severe limitations for cultivated crops because of flooding, wetness, and droughtiness. This soil is not cultivated in Clay County.

In its natural state, this soil is moderately well suited to improved pasture grass and grass-legume mixtures. For a good vegetation cover and maximum yields, proper management is needed. Pasture management should include flood control measures, proper applications of fertilizer and lime, and controlled grazing.

This soil is not recommended for pines because of excessive wetness and flooding, but if pines are planted, adequate drainage and bedding in rows are required for best results. The potential of this soil for production of slash pine is moderate. Equipment use, plant competition, and seedling mortality are concerns in management.

The potential of this soil as habitat for openland wildlife and woodland wildlife is fair. The potential as habitat for wetland wildlife is poor.

Limitations affecting urban development, which includes septic tank absorption fields, dwellings, and small commercial buildings, are severe. Flooding and wetness are the major problems. A drainage system is needed and a suitable fill material must be added to help control flooding and to keep the high water table at an effective depth.

Limitations affecting recreational development are severe. The high water table, which is at or near the surface during wet periods, and the loose sandy surface texture are the main limitations. Flooding is a hazard if the soil is used for camp areas or playgrounds. A water control system is needed to rapidly remove the excess water during rainy periods. Because of the loose, sandy surface during dry periods, soil blowing is a hazard, and trafficability is a problem. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer will help overcome these problems. Flooding must be controlled.

This Leon soil is in capability subclass VIw. The woodland ordination symbol for this soil is 8W.

51—Pottsburg fine sand, occasionally flooded. This soil is nearly level and poorly drained. It is on the flood plains. The mapped areas are irregular in shape or elongated and range from 50 to 500 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark gray fine sand about 4 inches thick. The subsurface layer is fine sand. The upper part, to a depth of 25 inches, is grayish brown. The next layer, to a depth of 46 inches, is gray. The lower part, to a depth of 65 inches, is light gray. The subsoil to a depth of 80 inches or more is dark reddish brown fine sand. The sand grains in the subsoil are well coated with organic material.

Included with this soil in mapping are small areas of Hurricane, Leon, Lynn Haven, Osier, Plummer, and Rutlege soils. Also included are soils that are similar to Pottsburg soil but have a stained layer at a depth of more than 50 inches. The included soils make up 20 percent or less of the map unit.

This soil has a high water table at a depth of less than 12 inches for 1 to 4 months during most years. It recedes to a depth of more than 40 inches during very dry periods. Flooding occurs about every 2 or 3 years. The available water capacity is low. The permeability is moderate.

The natural vegetation is mostly longleaf and slash pine. The understory is saw palmetto, running oak, gallberry, waxmyrtle, huckleberry, pineland threeawn, bluestem, briers, brackenfern, and other native forbs and grasses.

This Pottsburg soil has very severe limitations for cultivated crops because of flooding, wetness, and droughtiness. Adapted crops that can be grown on this soil are limited. Special crops are generally better adapted to this soil than the general farm crops. A water control system and intensive use of management practices are needed if this soil is cultivated. The water control system should remove excess water in wet periods and provide for subsurface irrigation in dry periods. Row crops should be planted in alternate strips with close-growing, soil-improving cover crops. Crop residue, including the residue of the soil-improving

crops, should be used to protect the soil from erosion and maintain the organic matter content. Row crops should be bedded. Fertilizer and lime should be added according to the needs of the crop.

This soil has severe limitations for pasture. It is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass and grass-legume mixtures can be grown with proper management. Pasture management should include proper application of fertilizer and lime and controlled grazing. A water control system is needed to remove excess water after heavy rains. Irrigation is needed during droughty periods for shallow-root plants, such as white clover.

This soil is moderately suited to the production of slash and longleaf pines. Equipment use, seedling mortality, and plant competition are concerns in management. Seasonal wetness is the main limitation. Timely scheduling of site preparation and planting, thinning, and harvesting operations can help overcome this wetness limitation. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, help to establish seedlings, control competing vegetation, reduce debris, and facilitate planting operations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland, woodland, and wetland wildlife is poor.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe. Flooding and wetness are the major problems. A drainage system is needed and suitable fill material must be added to help control flooding and to keep the high water table at an effective depth before any urban development begins.

Limitations affecting recreational development are severe. Flooding, the high water table, which is at or near the surface during wet periods, and the loose, sandy surface texture are the main problems. A water control system is needed to rapidly remove the excess water during rainy periods. Because of the loose, sandy surface during dry periods, soil blowing is a hazard and trafficability is a problem. Establishing and maintaining windbreaks or good vegetation cover or adding suitable topsoil or some other surface stabilizer will help overcome these problems. Flooding must be controlled.

This Pottsburg soil is in capability subclass IVw. The woodland ordination symbol for this soil is 8W.

52—Meggett fine sandy loam, frequently flooded. This soil is nearly level and poorly drained. It is on the flood plains. The mapped areas are irregular in shape to elongated and range from 15 to 150 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark gray fine sandy loam about 5 inches thick. The subsurface layer, to a depth of about 12 inches, is grayish brown fine sandy loam. The subsoil, to a depth of 59 inches, is gray mottled sandy clay and to a depth of 80 inches is gray sandy clay.

Included with this soil in mapping are small areas of Goldhead, Meadowbrook, Pelham, and Plummer soils. The included soils make up about 20 percent of the map unit.

This soil has a high water table at a depth of less than 12 inches for long periods during most years. Flooding occurs in most years. The available water capacity is moderate. The permeability is slow.

The natural vegetation is mainly water oak, sweetgum, blackgum, red maple, slash pine, loblolly pine, waxmyrtle, scattered saw palmetto, and gallberry. Water-tolerant grasses are in a few areas.

Because of prolonged wetness and flooding, this soil is not suited to cultivated crops, improved pasture grasses, or pine tree production unless major drainage systems are developed. Because of flooding, a drainage system is difficult to establish and is costly to maintain.

The potential of this soil as habitat for wetland wildlife is good. Shallow water areas can be developed in these areas as habitat for wetland wildlife. The potential for use as habitat for openland wildlife is fair, and it is good for use as habitat for woodland wildlife.

Prolonged wetness is severe a limitation affecting urban uses, such as sanitary facilities, building sites, and recreational development. In addition, the hazard of flooding is severe.

This Meggett soil is in capability subclass VIw. This woodland ordination symbol for this soil is 13W.

54—Troup sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and is well drained. It is on slight knolls and broad ridges on the uplands. The mapped areas range from 20 to 200 acres. The slopes are nearly smooth or convex.

Typically, this soil has a surface layer of grayish brown sand about 4 inches thick. The subsurface layer, to a depth of 64 inches, is light yellowish brown sand. The subsoil to a depth of 80 inches or more is yellowish red sandy loam.

Included with this soil in mapping are small areas of Albany, Blanton, Kershaw, and Penney soils. The included soils make up about 20 percent or less of the map unit.

This soil has a high water table at a depth of more than 72 inches. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly turkey oak, post oak, scattered longleaf pine, rosemary, and pineland threeawn. Some areas are planted to sand pine.

This Troup soil has severe limitations for most cultivated crops because of droughtiness and rapid leaching of plant nutrients. It is moderately well suited to the production of corn, peanuts, and watermelons. Management practices to obtain optimum yields should include irrigating during droughty periods, using soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. Soil blowing is a hazard if the surface is not protected, especially during dry periods. Conservation tillage helps to control erosion and conserve moisture.

This soil has slight limitations for pasture. It is moderately well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. For maximum yields, this soil requires regular applications of fertilizer and lime, and grazing must be controlled. Irrigation is generally necessary during dry periods for the production of shallow root pasture plants.

This soil is moderately suited to the production of slash pine, longleaf pine, and loblolly pine. Equipement use, seedling mortality, and plant competition are concerns in management. This soil is droughty and during long, dry periods does not retain enough moisture for plant growth. Use of special planting stock that is larger than usual, or that is containerized, will reduce the rate of seedling mortality. The use of equipment with large tires or tracks will help overcome the equipment limitations that are caused by the loose, sandy surface of this soil. Controlling the growth of hardwood understory by chemical or mechanical methods will reduce plant competition. All plant debris should be left on the site to help maintain the organic matter in the soil.

The potential of this soil as habitat for openland wildlife is fair; and as habitat for woodland wildlife, it is poor. The potential as habitat for wetland wildlife is very poor because of the absence of water areas. This soil does not produce a suitable supply of food for most wildlife.

Limitations affecting dwellings and small commercial buildings and septic tank absorption fields are only slight.

Limitations affecting recreational development are severe. During dry periods, soil blowing and maintaining good trafficability are severe problems. Establishing and maintaining good vegetation cover and windbreaks and adding suitable topsoil or some other hard surface stabilizer will improve or help overcome these problems.

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

56—Kershaw sand, 0 to 8 percent slopes. This soil is nearly level to moderately sloping and is excessively drained. It is on the deep, sandy uplands. The mapped areas are irregular in shape and range from 15 to 1,500 acres. The slopes are nearly smooth to convex.

Typically, this soil has a surface layer of dark grayish brown sand about 4 inches thick. The upper part of the underlying material, to a depth of 68 inches, is brownish yellow sand. The lower part to a depth of 80 inches is yellow sand.

Included with this soil in mapping are some small areas of Ortega, Penney, and Troup soils. Also included are small areas of soils that are similar to Kershaw soil but have a coarser texture. The included soils make up about 10 percent or less of the map unit.

This soil has a high water table at a depth of more than 80 inches. The available water capacity is very low. The permeability is very rapid.

The natural vegetation consists mostly of turkey oak, bluejack oak, post oak, scrub live oak, and longleaf pine. The understory is mainly a sparse growth of pineland threeawn, indiangrass, chalky bluestem, various panicums, and rosemary.

This Kershaw soil has very severe limitations for cultivated crops. This soil is unable to retain sufficient moisture during dry periods because of its coarse texture. Plant nutrients applied to the soil are rapidly leached. Irrigation is needed for cultivated crops.

This soil has moderate limitations for pasture. It is moderately suited to deep-root grasses, such as bahiagrass and improved bermudagrass, but yields are generally reduced by periodic droughts. To maintain good grazing, careful management is required. This includes establishing the proper plant population and applying fertilizer and lime, and also grazing must be controlled. Irrigation will help improve the quality of grazing and the hay crops and during long, dry periods irrigation may be economically justifiable if water is readily available. This soil is not suited to shallow-root pasture plants because the soil can not retain sufficient moisture in the root zone for good plant growth.

This soil is poorly suited to the production of slash, longleaf, and sand pines. Equipment use and seedling mortality are concerns in management. The use of equipment with large tires or tracks can help overcome the equipment limitations that are caused by the loose, sandy surface of this soil. This soil has very low available water capacity and does not provide enough moisture for a good rate of seedling survival. Use of special planting stock that is larger than usual, or that is containerized, will reduce the rate of seedling mortality. Timely scheduling of planting operations during periods when rains are more frequent can also help reduce the rate of seedling mortality. All plant debris should be left on the site to help maintain the organic matter.

The potential as habitat for openland wildlife is poor; and as habitat for woodland wildlife, it is very poor. The potential as habitat for wetland wildlife is very poor because of the absence of water areas. This soil does not produce a suitable source of food for wetland wildlife.

Limitations affecting dwellings and small commercial buildings are slight. Limitations affecting septic tank absorption fields are slight; however, because of poor filtration, ground water contamination can be a hazard in areas that have a concentration of septic tank absorption fields.

Limitations affecting recreational development are severe. Soil blowing and maintaining good trafficability are severe problems. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer help to overcome these problems.

This Kershaw soil is in capability subclass VIIs. The woodland ordination symbol for this soil is 8S.

58—Allanton fine sand, frequently flooded. This soil is nearly level and very poorly drained. It is in poorly defined drainageways on the broad flatwoods. The shape of the mapped areas is variable, and the areas range from 50 to 500 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, the surface layer of this soil is fine sand. The upper part, to a depth of about 12 inches, is very dark gray. The lower part, to a depth of 18 inches, is very dark grayish brown. The subsurface layer is fine sand. The upper part, to a depth of 26 inches, is dark gray. The next layer, to a depth of 56 inches, is grayish brown. The upper part of the subsoil, to a depth of 63 inches, is very dark grayish brown fine sand. The lower part to a depth of 80 inches is very dark gray fine sand. The sand grains in the subsoil are well coated with organic material.

Included with this soil in mapping are small areas of Lynn Haven, Osier, Pottsburg, Rutlege, and Surrency soils. The included soils make up less than 20 percent of the map unit.

This soil has a high water table within 12 inches of the surface for 3 to 5 months of the year. Flooding occurs in most years, and the surface generally is covered with water for 3 months or more. The available water capacity is low. The permeability is moderately rapid.

The natural vegetation is blackgum, sweetgum, sweetbay, red maple, and some slash pine trees. The understory is waxmyrtle, gallberry, and pineland threeawn.

This Allanton soil has very severe limitations for cultivated crops. Flooding, restricted root zone, and proper drainage are major problems that are very difficult to overcome. Adequate water control systems are difficult to establish and maintain. In many areas, suitable drainage outlets are not available. If a water control system can be established and maintained, some vegetable crops can be grown on this soil.

This soil has severe limitations for pasture. If flooding is controlled and drainage systems installed and maintained, this soil is suitable for pasture. Because suitable drainage outlets are not available, the possibility of establishing an effective water control system is decreased. Proper pasture management for maximum yields includes establishing the proper plant population and applying fertilizer and lime, and also grazing must be controlled.

Under natural conditions, this soil is not recommended for slash pine, loblolly pine, or longleaf pine because of excessive wetness. The potential of this soil for production of loblolly pine is high if surface drainage is adequate and flooding is controlled. Wetness is a severe limitation. Equipment use, plant competition, and seedling mortality are concerns in management. The high water table and flooding are the major concerns in management and must be overcome to obtain maximum yields.

The potential of this soil as habitat for wetland wildlife is good. Shallow water areas can be developed in these areas as habitat for wetland wildlife. The potential as habitat for openland wildlife is poor, and it is fair for woodland wildlife.

Limitations affecting urban use are severe. Flooding and wetness are dominant features that need to be overcome before any urban development begins.

Limitations affecting recreational development are severe. The flooding condition and sandy texture are the major problems. Before the soil can be used for

recreational areas, adequate drainage and a water control system are necessary. The addition of suitable fill material is needed to improve trafficability and to raise the surface sufficiently to prevent a continuing wetness problem.

This Allanton soil is in capability subclass Vw. The woodland ordination symbol for this soil is 10W.

59—Lynn Haven fine sand. This soil is nearly level and poorly drained. It is in broad areas on the flatwoods. The mapped areas are irregular in shape or elongated and range from 10 to 200 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, the surface layer of this soil is fine sand. The upper part, to a depth of about 12 inches, is black. The lower part, to a depth of 19 inches, is very dark gray. The subsurface layer, to a depth of 26 inches, is grayish brown fine sand. The subsoil is fine sand. The upper part, to a depth of 22 inches, is black. The next layer, to a depth of 55 inches, is dark brown. The lower part to a depth of 80 inches is black.

Included with this soil in mapping are small areas of Allanton, Leon, Osier, Pottsburg, and Rutlege soils. Also included are soils that have slopes that range from 0 to 5 percent. The included soils make up less than 20 percent of the map unit.

This soil has a high water table at a depth of less than 12 inches for 2 to 4 months during most years. It recedes to a depth of more than 40 inches during very dry periods. The available water capacity is moderate. The permeability is moderate or moderately rapid.

The natural vegetation is mainly longleaf pine, slash pine, and pond pine. The understory is saw palmetto, running oak, gallberry, waxmyrtle, huckleberry, pineland threeawn, bluestem, briers, brackenfern, and other native forbs and grasses. Most areas are in natural vegetation. The cleared areas are in improved pasture.

This Lynn Haven soil has very severe limitations for cultivated crops mostly because of wetness. The number of adapted crops that can be grown is limited unless water control measures are used. With proper water control, this soil is suitable for most locally grown crops. Special crops are better adapted to this soil than most of the general farm crops. A water control system is needed to remove excess water during wet periods and to provide for subsurface irrigation during dry periods. Row crops should be planted in alternate strips with close-growing, soil-improving cover crops. Crop residue, including the residue of the soil-improving crops, should be returned to the soil. Rows should be bedded. Fertilizer and lime should be added according to the needs of the crop.

In its natural state, this soil has severe limitations for pasture. With proper water control, the soil is well suited to improved bermudagrass, bahiagrass, and legumes. A water control system is needed to remove excess surface water during long rainy periods. For maximum yields, irrigation is needed during dry periods for white clover or other adapted shallow-root pasture plants. Pasture management for good vegetation cover and maximum productivity includes establishing the proper plant population and applying fertilizer and lime, and also grazing must be controlled.

This soil is moderately well suited to the production of slash, loblolly, and longleaf pines. Equipment use, seedling mortality, and plant competition are concerns in management. Seasonal wetness is the main limitation. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation and planting and harvesting operations should be scheduled during dry periods to also help overcome the equipment limitations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland wildlife is fair. The potential as habitat for woodland and wetland wildlife is poor.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe because of the depth of the high water table during wet periods. A drainage system is needed to remove the excess surface water during wet periods and to adequately control the high water table. Adding suitable fill material to help keep the high water table at an effective depth will help overcome the wetness limitation.

Limitations affecting recreational development are severe. The high water table, which is at or near the surface during wet periods, is a major problem. A water control system is needed to improve this condition. Trafficability is a problem. Because of the loose, sandy surface during dry periods, soil blowing is a hazard. Maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer helps to overcome these problems.

This Lynn Haven soil is in capability subclass IVw. The woodland ordination symbol for this soil is 11W.

60—Ridgeland fine sand. This soil is nearly level and somewhat poorly drained. It is in small to relatively large areas on slight rises on the flatwoods. The areas are irregular in shape and range from 5 to 100 acres.

The slopes are slightly convex and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark grayish brown and dark grayish brown fine sand about 8 inches thick. The subsoil is also fine sand. The upper part, to a depth of 18 inches, is very dark brown and very dark grayish brown, and the sand grains are well coated with organic material. The next layer, to a depth of 65 inches, has very little organic matter and is pale brown, light gray, and white. The lower part to a depth of 80 inches is dark reddish brown and dark brown, and the sand grains are coated with organic matter.

Included with this soil in mapping are small areas of Centenary, Hurricane, Leon, Mandarin, Ona, and Ridgewood soils. The included soils make up about 20 percent or less of the map unit.

This soil has a high water table at a depth of 18 inches for about 30 days during most years. It is at a depth of 18 to 50 inches during most of the remainder of the year. The available water capacity is low. The permeability is moderate or moderately rapid.

The natural vegetation is slash pine, longleaf pine, post oak, live oak, and water oak. The understory is greenbrier, saw palmetto, running oak, waxmyrtle, pineland threeawn, dwarf huckleberry, carpetgrass, and various bluestems and panicums.

This Ridgeland soil has severe limitations for cultivated crops because of periodic wetness and droughtiness. During wet periods, the high water table will retard root development. With proper management and a water control system, the most locally grown crops are adapted to this soil. Management practices to obtain high yields should include close-growing, soil-improving cover crops in the rotation system, returning crop residue to the soil, and applying fertilizer and lime. Soil blowing is a hazard if the surface is not protected, especially during dry periods.

This soil has slight limitations for pasture. It is moderately well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. For maximum yields, this soil requires regular applications of fertilizer and lime, and also grazing must be controlled.

This soil is moderately suited to the production of slash and longleaf pine. Equipment use, seedling mortality, and plant competition are concerns in management. The use of equipment with large tires or tracks can help overcome equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce seedling mortality, and increase early growth. Chopping and bedding will also reduce debris, control competing vegetation, and facilitate planting operations. Controlling the growth of hardwood understory by chemical or mechanical methods will reduce plant competition. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland and woodland wildlife is poor. The potential as habitat for wetland wildlife is very poor.

Limitations affecting dwellings without basements and small commercial buildings are moderate. Limitations affecting septic tank absorption fields are severe because of the depth of the water table during wet periods. Adding suitable fill material will help overcome the wetness limitation. If outlets are available, a surface drainage system can be installed.

Limitations affecting recreational development are severe. The sandy surface layer causes trafficability problems, and soil blowing is a hazard during dry periods. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer help to overcome these problems.

This Ridgeland soil is in capability subclass IIIw. The woodland ordination symbol for this soil is 10W.

61—Wesconnett fine sand, frequently flooded. This soil is nearly level and very poorly drained. It is in broad drainageways on the flatwoods. The mapped areas range from 50 to 500 acres and are elongated or irregular in shape. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark brown fine sand about 12 inches thick. The subsoil is also fine sand, and to a depth of about 51 inches, the sand grains are are well coated with organic matter. The upper part, to a depth of 30 inches, is black. The next layer, to a depth of 41 inches, is very dark gray, and below that layer, to a depth of 51 inches, the subsoil is dark reddish brown. The next layer, to a depth of 65 inches, is dark brown, and the sand grains have very little organic coating. The lower part to a depth of 80 inches is black, and the sand grains are coated with organic matter.

Included with this soil in mapping are small areas of Allanton, Osier, Rutlege, Lynn Haven, and Leon soils. The included soils make up about 20 percent or less of the map unit.

This soil is frequently flooded for periods of very long duration. Floodwater may be as much as 2 feet deep.

The water table is within 12 inches of the surface for most of the year except during long, extended dry periods. The available water capacity is moderate. The permeability is moderate or moderately rapid.

The natural vegetation is mainly baldcypress. Sweetbay, blackgum, slash pine, and red maple are in some areas, and water-tolerant grasses are in a few areas.

This Wesconnett soil has very severe limitations for cultivated crops. Flooding, the restricted root zone, and proper drainage are major problems that are very hard to overcome. Adequate water control systems are difficult to establish and maintain. In many areas, suitable drainage outlets are not available. If a water control system can be established, some vegetable crops can be grown.

This soil has severe limitations for pasture. If flooding is controlled and a drainage system installed and maintained, this soil is suitable for pasture; however, because suitable drainage outlets are not available, the possibility of establishing an effective water control system is decreased. Proper pasture management for maximum yields includes establishing the proper plant population and applying fertilizer and lime, and also grazing must be controlled.

Under natural conditions, this soil is not recommended for slash pine, loblolly pine, or longleaf pines because of excessive wetness. The potential of this soil for production of slash pine is high if surface drainage is adequate and flooding is controlled. Wetness is a severe limitation for equipment use on this soil. Plant competition and seedling mortality also are concerns in management. The high water table and flooding are the major concerns in management and must be overcome to obtain maximum yields.

The potential of this soil as habitat for wetland wildlife is good. These shallow water areas are desirable to wetland wildlife. The potential as habitat for openland and woodland wildlife is poor. This soil is too wet and does not produce a good source of food and cover desirable to openland or woodland wildlife.

Limitations affecting urban use are severe. Flooding and wetness are dominant features that need to be overcome before any urban development begins.

Limitations affecting recreational development are severe. The flooding condition and sandy texture are the major problems to overcome. A drainage system, flood control structures, and the addition of sufficient amounts of suitable fill material are needed.

Wesconnett soil is in capability subclass VIw. The woodland ordination symbol for this soil is 11W.

62—Neilhurst fine sand, undulating. This soil is gently undulating and excessively drained. It is a mixture of fine sand or sand. This soil is dominantly spoil material from mining operations. This material is dredged, and the heavy minerals are recovered. The soil in this map unit is mostly in the western and southern parts of the county near the Bradford and Putnam County lines. The mapped areas generally range from triangular to rectangular and range from about 100 to 1,000 acres. The slopes are mostly 2 to 5 percent but range from 1 to 12 percent in the more steep areas on the short side slopes.

No one pedon represents this soil, but the surface layer of one of the more common pedons is gray fine sand about 3 inches thick. The underlying material to a depth of 80 inches is reddish brown fine sand with dark reddish brown, reddish brown, and dark reddish gray splotches and streaks.

Included with this soil in mapping are small areas of Solite soils. Also included are soils that are similar to Neilhurst soils but are somewhat poorly drained and small bodies of water. The included soils make up about 20 percent or less of the map unit.

This soil has a water table at a depth of more than 6 feet. The available water capacity is very low. The permeability is very rapid. This soil is highly erodible, especially on the steeper slopes. Most areas have been shaped to reduce erosion, but few areas are vegetated.

The natural vegetation is a variety of scattered weeds and grasses. Some areas are planted to slash and longleaf pine. Extensive management is needed for good plant growth and woodland production.

This Neilhurst soil is not used for cultivated crops and pasture; however, with proper management and after grasses have been established, good yields from pasture grasses can be expected. Droughtiness, rapid leaching of nutrients, and the loose, sandy surface are the major limitations.

This soil is moderately suited to the production of slash, longleaf, and sand pines. Equipment use and moderate seedling mortality are concerns in management. The use of equipment with large tires or tracks can help overcome the equipment limitations that are caused by the loose, sandy surface of this soil. This soil has very low available water capacity and does not provide enough moisture for a good rate of seedling survival. Use of special planting stock that is larger than usual, or that is containerized, can reduce the rate of seedling mortality. Timely scheduling of planting operations during periods when rains are more frequent can also reduce the rate of seedling mortality. All plant

debris should be left on the site to help maintain the organic matter in the soil.

The potential of this soil as habitat for openland wildlife and woodland wildlife is poor. The potential as habitat for wetland wildlife is very poor.

Limitations affecting dwellings and small commercial buildings and septic tank absorption fields are slight; however, because of poor filtration, ground water contamination can be a hazard in areas that have a concentration of septic tank absorption fields.

Limitations affecting recreational development are severe. The loose, sandy surface texture causes trafficability problems, and soil blowing is a hazard during dry periods. Establishing and maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer help to overcome these problems.

This Neilhurst soil is in capability subclass VIs. The woodland ordination symbol for this soil is 8S.

63—Solite fine sand. This soil is nearly level and poorly drained. It is a mixture of fine sand or sand from Centenary, Hurricane, Leon, Mandarin, Osier, and Pottsburg soils. This soil is homogeneous, sandy soil material from mining operations. It has been reworked and shaped as a result of earthmoving operations. This material is dredged, and the heavy minerals are recovered. The soil in this map unit is mostly in the western and southern part of the county. The mapped areas generally range from triangular to rectangular and range from 100 to 1,000 acres. The slopes range from 0 to 2 percent.

This mixed soil has no defined horizonation but is a variable mixture of layers and colors. Typically, this soil has a surface layer of black fine sand about 5 inches thick. The underlying material is fine sand. The upper part, to a depth of 48 inches, is grayish brown. The next layer, to a depth of 60 inches, is very dark grayish brown. Below that layer, to a depth of 72 inches, the underlying material is dark grayish brown. The lower part to a depth of 80 inches is dark brown.

Included with this soil in mapping are Neilhurst soils. Also included are small areas of mixed sandy clay and sandy clay loam soils and small bodies of water. In places are soils that are similar to Solite soil but are very poorly drained. In places near the Bradford-Clay County line are areas of material that are high in reworked humus. The included soils make up about 20 percent or less of the map unit.

This soil has a high water table at a depth of less than 12 inches for 3 to 6 months during most years. It is at a depth of less than 30 inches for cumulative periods of about 3 to 6 months or more. The available water capacity is very low. The permeability is rapid.

The natural vegetation is a variety of scattered weeds and grasses. Some areas are planted to slash and longleaf pines. Drainage is needed for better plant adaption and growth.

This Solite soil has severe limitations for cultivated crops because of wetness and poor soil qualities. This soil is not cultivated and is not used as pasture in Clay County.

No woodland data are available for this soil. Wetness may cause severe problems for use of equipment on this soil and increase the rate of seedling mortality. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce seedling mortality, and increase early growth. The use of equipment with large tires or tracks can help overcome equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland wildlife and woodland wildlife is poor. The potential as habitat for wetland wildlife is fair.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe. Wetness is the major limitation. A drainage system is needed, and adding suitable fill material will also help to overcome the wetness limitation.

Limitations affecting recreational development are severe. The high water table, which is at or near the surface during wet periods, and the loose, sandy surface texture are the main limitations. A water control system should be established and maintained, and a good cover to stabilize the loose, sandy surface is needed to overcome this problem.

This Solite soil is in capability subclass IVw. The woodland ordination symbol for this soil is 8W.

64—Ona fine sand. This soil is nearly level and poorly drained. It is in small areas on the flatwoods. The mapped areas are irregular in shape and range from 10 to 100 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark gray fine sand about 5 inches thick. The subsoil is fine sand. The upper part, to a depth of 15 inches, is dark brown, and the sand grains are coated with organic material. The next layer, to a depth of 30 inches, is dark gray. Below that layer, to a depth of 41 inches, the subsoil is dark grayish brown. The next layer, to a depth

of 60 inches, is very dark brown with grayish brown mottles. Many sand grains are coated with organic material. The lower part of the subsoil to a depth of 80 inches is dark brown, and many sand grains are coated with organic matter.

Included with this soil in mapping are small areas of Allanton, Leon, Lynn Haven, Pottsburg, Osier, and Rutlege soils. The included soils make up about 20 percent or less of the map unit.

This soil has a high water table within 12 inches of the surface for 2 to 4 months during most years. During very dry periods the high water table recedes to a depth of more than 40 inches. The available water capacity is low. The permeability is moderate.

The natural vegetation is mainly longleaf pine, loblolly pine, slash pine, blackgum, and water oak. The understory is saw palmetto, gallberry, pineland threeawn, huckleberry, waxmyrtle, fetterbush, and various bluestems and panicums.

This Ona soil has very severe limitations for cultivated crops because of wetness and droughtiness. The number of adapted crops that can be grown is limited unless water control measures are used. With proper water control, this soil is suitable for most locally grown crops. Special crops are better adapted to this soil than most general farm crops. A water control system is needed to remove excess water during wet periods and provide for subsurface irrigation during dry periods. Row crops should be planted in alternate strips with close-growing, soil-improving cover crops. Crop residue, including the residue of the soil-improving crops, should be returned to the soil. Rows should be bedded. Fertilizer and lime should be added according to the needs of the crop.

In its natural state, this soil has severe limitations for pasture. With proper water control, the soil is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with good management. A water control system is needed to remove excess surface water during long rainy periods. For maximum yields, irrigation is needed during dry periods for white clover or other adapted shallow-root pasture plants. Proper pasture management for good vegetation cover and maximum productivity includes establishing the proper plant population and applying fertilizer and lime, and also grazing must be controlled.

This soil is moderately suited to the production of slash and longleaf pines. Equipment use, seedling mortality, and plant competition are concerns in management. Seasonal wetness is the main limitation. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. Site preparation and planting and harvesting operations should be scheduled during dry periods to also help overcome the equipment limitations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland, woodland, and wetland wildlife is fair.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe because of the depth of the high water table during wet periods. A drainage system is needed to remove the excess surface water during wet periods and to adequately control the high water table. Adding suitable fill material to keep the high water table at an effective depth will help overcome the wetness limitation.

Limitations affecting recreational development are severe. The high water table, which is at or near the surface during wet periods, is a major problem. A water control system should be established and maintained to improve this condition. Trafficability is a problem. Because of the loose, sandy surface during dry periods, soil blowing is a hazard. Maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer helps to overcome these problems.

This Ona soil is in capability subclass IIIw. The woodland ordination symbol for this soil is 10W

65—Meadowbrook sand. This soil is nearly level and poorly drained. It is in small and large areas on the flatwoods. The mapped areas are irregular in shape and range from 10 to 100 acres. The slopes are nearly smooth and range from 0 to 2 percent.

Typically, this soil has a surface layer of very dark gray sand about 7 inches thick. The subsurface layer, to a depth of 42 inches, is gray sand. The subsoil to a depth of 80 inches is gray and light gray sandy loam.

Included with this soil in mapping are small areas of Albany, Osier, Pelham, and Sapelo soils. Also included are a few areas of soils that have a sand surface layer. The included soils make up about 15 percent of the map unit.

This soil has a high water table within 12 inches of the surface for 1 to 3 months. It is at a depth of 12 to 40 inches for about 3 to 4 months during most years.

During droughty periods, it is at a depth of more than 40 inches. The available water capacity is low. The permeability is moderately slow.

The natural vegetation is mainly slash pine, loblolly pine, longleaf pine, swamp tupelo, live oak, and baldcypress. The understory is dominantly gallberry, waxmyrtle, pineland threeawn, dwarf huckleberry, brackenfern, bluestem, and various panicums.

This Meadowbrook soil has very severe limitations for cultivated crops because of wetness and droughtiness. The number of adapted crops that can be grown is limited unless water control measures are used. With proper water control, this soil is suitable for most locally grown crops. Special crops are better adapted to this soil than most of the general farm crops. A water control system is needed to remove excess water during wet periods and provide for subsurface irrigation during dry periods. Row crops should be planted in alternate strips with close-growing, soil-improving cover crops. Crop residue, including the residue of the soil-improving crops, should be returned to the soil. Rows should be bedded. Fertilizer and lime should be added according to the needs of the crop.

In its natural state, this soil has severe limitations for pasture. With proper water control, the soil is well suited to improved bermudagrass, bahiagrass, and legumes. Good quality pasture grass or grass-legume mixtures can be grown with proper management. A water control system is needed to remove excess surface water during long rainy periods. For maximum yields, irrigation is needed during dry periods for white clover or other adapted shallow-root pasture plants. Proper pasture management for good vegetative cover and maximum productivity includes establishing the proper plant population and applying fertilizer and lime. Grazing also must be controlled.

This soil is moderately well suited to the production of slash, loblolly, and longleaf pines. Equipment use, seedling mortality, and plant competition are concerns in management. Seasonal wetness is the main limitation. The use of equipment with large tires or tracks can help overcome the equipment limitations, reduce soil compaction, and reduce root damage during thinning operations. Site preparation, such as harrowing and bedding, will help establish seedlings, reduce debris, control competing vegetation, and facilitate planting operations. Site preparation and planting and harvesting operations should be scheduled during dry periods to also help overcome equipment limitations. All plant debris should be left on the site to help maintain the organic matter in the soil. Fertilizer can provide excellent growth response.

The potential of this soil as habitat for openland, woodland, and wetland wildlife is fair.

Limitations affecting dwellings without basements and small commercial buildings and septic tank absorption fields are severe because of the depth of the high water table during wet periods. A drainage system is needed to remove the excess surface water during wet periods and to adequately control the high water table. Adding suitable fill material to help keep the high water table at an effective depth will help overcome the wetness limitation.

Limitations affecting recreational development are severe. The high water table, which is at or near the surface during wet periods, and the loose, sandy surface texture are the main limitations. A water control system should be established and maintained to improve this condition. Trafficability is a problem. Because of the loose, sandy surface during dry periods, soil blowing is a hazard. Maintaining good vegetation cover or windbreaks or adding suitable topsoil or some other surface stabilizer helps to overcome these problems.

This Meadowbrook soil is in capability subclass IVw. The woodland ordination symbol for this soil is 10W.

Use and Management of the Soils

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

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

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

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

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

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

Crops and Pasture

Hal Summers, district conservationist, Soil Conservation Service; Jessie Goldbold, extension director, Cooperative Extension Service; and Norman Porter, resource conservationist, Soil Conservation Service, helped to 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 county, 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 "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

According to the 1982 Census of Agriculture by the United States Department of Commerce, about 27,236 acres in Clay County was used for crops and pasture. Of this total, about 14,878 acres was used as permanent pasture, and 12,358 acres was used for special crops.

The acreage in crops and pasture has been gradually decreasing as more land is used for urban development. In 1984, about 12,720 acres was used as urban land in the county, and since then, this acreage has been steadily increasing.

Soil erosion is a problem on about one-fourth of the cropland and pasture in Clay County. If the slope is more than 2 percent, erosion is a hazard, especially in areas of moderately well drained Blanton, Centenary, and Ortega soils and somewhat poorly drained Ocilla, Ridgewood, Hurricane, and Albany soils.

Loss of the surface layer through erosion is damaging because productivity is reduced as the surface layer is lost and part of the subsoil is mixed into the plow layer. Soil erosion on farmland results in sediment entering streams. Erosion control minimizes sediment pollution of streams and lakes and improves the quality of water for municipal use, for recreational uses, and for habitat for fish and wildlife. Erosion

control practices provide a protective surface cover, reduce runoff, and increase infiltration.

Wind erosion is a major hazard on the sandy soils in the county. Strong winds can damage soils and tender crops in a few hours in open, unprotected areas if the soil is dry and bare of vegetation and surface mulch. Maintaining vegetation cover and surface mulch minimizes the damage caused by blowing soil. Wind erosion is damaging because it reduces soil fertility by removing fine soil particles and organic matter; it damages or destroys crops by sandblasting; it spreads diseases, insects, and weed seeds; and it creates health hazards and cleaning problems. Control of wind erosion minimizes duststorms and improves the quality of air for more healthful living conditions. Field windbreaks, stripcropping, and conservation tillage are conservation practices that will reduce wind erosion on cropland.

Field windbreaks and stripcropping or narrow plantings are made at right angles to the prevailing winds and at specific intervals across the field. The intervals depend on the erodibility of the soil and the susceptibility of the crop to damage from sandblasting.

Conservation tillage is a method that does not bury all crop residue. Protective amounts of residue mulch are retained on the surface to protect the soil from erosion and the crops from sandblasting.

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

Additional information on planting windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service, the Cooperative Extension Service, or a nursery. Information about erosion control practices for each kind of soil is in the "Water and Wind Erosion Control Handbook—Florida," which is available in local offices of the Soil Conservation Service.

Soil drainage is a major concern in management on about 25 percent of the acreage used for crops and pasture in the county. Some soils are so naturally wet that the growing of crops that are common to the area is generally not practical. Leon, Osier, Plummer, Pelham, and Sapelo soils are examples of poorly drained soils, and Rutlege soils are examples of very poorly drained soils. These soils make up about 77,349 acres in the county.

Unless artificially drained, some of the somewhat poorly drained soils are wet enough in the root zone to damage some crops during wet periods. Albany, Hurricane, and Ocilla soils, which make up about 40,978 acres of the county, are examples of the somewhat poorly drained soils. Also, unless artificially drained, some of the poorly drained soils, such as Leon, Pottsburg, and Sapelo soils, are wet enough to cause some damage to pasture plants. These soils need subsurface drainage to obtain adequate pasture yields. These soils also have a low available water capacity and are droughty during dry periods.

The very poorly drained Rutlege and Surrency soils are very wet during rainy periods and have water standing on the surface in most areas. Unless artificially drained, the production of good quality pasture plants on these soils is not possible. A combination of surface drainage and irrigation is needed on these soils for intensive pasture production. Information on drainage and irrigation for each kind of soil in Clay County is available at the local offices of the Soil Conservation Service.

Soil fertility is naturally low in most soils in the county. Most of the soils have a sandy surface layer and are light in color. Many of the soils, such as Albany, Blanton, Meggett, Pelham, and Plummer soils, have a loamy subsoil. Most of the soils have a strongly acid or very strongly acid surface layer and require application of ground limestone to sufficiently raise the pH level for good crop growth. The levels of nitrogen, potassium, and available phosphorus are naturally low in most of these soils. The addition of lime and fertilizer should be based on the results of soil tests, the needs of the crop, and the expected 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 the infiltration of water into the soil. Soils with good tilth are easily cultivated with common tillage equipment and provide a good seedbed.

Most of the soils in the county have a sandy or loamy fine sand surface layer that is light in color and low to moderate in organic matter content. Generally, the structure of the surface layer of most soils in the county is weak. When soils that are dry and low in organic matter content receive intense rain, a thin crust forms on the soil surface. The crust is slightly hard when it is dry, and it is slightly impervious to water. Once the crust forms, it reduces infiltration and increases runoff. Regular additions of crop residue, manure, and other organic material improve soil structure and reduce crust formation.

Fall plowing is generally not advisable. Sloping soils make up about one-fourth of the cropland in the county;

and if these soils are plowed at this time, they are subject to damaging erosion. Gullies caused by erosion are common on unprotected soils. Also, about three-fourths of the county's cropland is sandy and subject to soil blowing. Significant crop damage results from the sandblasting effect of blowing soil. The soil's water and nutrient holding capacity are also reduced by soil blowing. The organic matter and fine soil particles, which hold moisture and nutrients, are the first to be removed by wind erosion.

Special crops grown commercially in the county are vegetables, small fruits, and nursery plants. A small acreage is used for melons, blueberries, sweet corn, tomatoes, greens, other vegetable crops, citrus crops, and small fruits. The latest information and suggestions for growing special crops can be obtained from local offices of the Soil Conservation Service and the Cooperative Extension Service.

Pasture production in many parts of the county has been greatly depleted by continued, excessive use. Pasture productivity can be increased by using management practices that are effective for the specific kinds of soil and pasture plants to be grown.

Farm income is mostly derived from livestock, mainly dairy cattle, poultry, and beef. On most dairy farms, the pasture forage produced is supplemented by green chop and small grains (fig. 11).

In areas of similar climate and topography, differences in the kinds and amount of forage that the pasture can produce are related closely to the kind of soil. Effective management is based on the relationships among soils, pasture plants, water management, and soil amendments.

The potential annual production of pasture for each kind of soil in animal-unit-months is shown in table 5. An animal-unit-month refers to the number of months during the normal growing season that an acre will provide grazing for one animal without damage to the sod. One animal unit is defined as one cow, one cow with calf, one horse, one steer, or five hogs.

The major pasture plants are improved bermudagrass, bahiagrass, white clover, and ryegrass. Small grains are used during the winter to supplement the permanent pastures. Millet, sorghum, and sudan hybrids are grown during the summer for green chop and grazing.

The latest information and suggestions for growing and managing pasture can be obtained from local offices of the Soil Conservation Service and the Cooperative Extension Service.

Yields Per Acre

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

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

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yield 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.

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

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

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

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for use as cropland. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria

Figure 11.—These dairy cows are grazing on Leon fine sand. If surface drainage and proper management practices are used, good quality pasture grasses can be produced on this poorly drained soil.

used in grouping the soils do not include major, and generally expensive, landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

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

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

Class I soils have few limitations that restrict their use. (Clay County has no class I soils.)

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices. (Clay County has no class II soils.)

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

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

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

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

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

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

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

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

The capability classification of each map unit is given in the section "Detailed Soil Map Units."

Woodland Management and Productivity

William Rutherford, forester, Florida Division of Forestry, helped to prepare this section.

Approximately 316,483 *(11)* acres, or 80 percent of the total land area in Clay County, is in woodland. The three distinct ownership classes are State forest, large corporate holdings, and small, privately owned tracts. Large companies own or lease most of the woodland acreage in the county. A small part of the acreage is privately owned and managed. Woodland resources are well distributed throughout the county.

The soils and climate of Clay County are suitable for commercial woodland production. Most woodland areas are on Hurricane, Leon, Pottsburg, and Sapelo soils on the flatwoods (fig. 12); on Penney, Centenary, and Ortega soils on the sand ridges; and on Rutlege, Osier, and Meadowbrook soils on the flood plains. Most of the woodland resources are in the northwestern, central, and southern parts of the county.

Slash pine is the predominant tree grown for commercial production in Clay County on corporate-owned and managed woodlands. It grows well even on the poorly drained soils on the flatwoods. Other needle-leaf trees grown in managed woodlands are loblolly pine, longleaf pine, sand pine, and baldcypress. Sand pine grows well on the small knolls and deep sand ridges. The common broad-leaf trees grown for commercial production are water oak, laurel oak, live oak, sweetgum, and blackgum.

Camp Blanding Military Reservation covers 72,000 acres. The predominant tree on this property is slash pine. This tree grows well on the poorly drained flatwoods. Some sand pine grows on the knolls and ridges on Penney, Centenary, and Kershaw soils. Red maple, blackgum (fig. 13), and cypress grow on wet soils, such as Allanton, Osier, and Rutlege soils, in depressions and drainageways. These trees have some commercial value. Other trees, such as water oak, live oak, laurel oak, and sweetbay, grow along the banks joining the drainageways that are supported by Albany, Blanton, and Ridgewood soils. At this time, these trees have limited commercial value.

A few small, privately owned woodland areas are scattered throughout the county. Much of this land is in plantation for the pulpwood and sawlog markets. Slash pine is the dominant tree.

Trees that are in natural stands are loblolly pine, longleaf pine, baldcypress, sweetgum, blackgum, water oak, laurel oak, sweetbay, red bay, and loblolly bay.

Timber management consists mostly of adequate water control, prescribed burning, clearcutting, site preparation, and replanting with seedlings. Some selective cutting and thinning are done by smaller companies and private owners. Fire, when controlled, is a useful tool because it reduces the underbrush and exposes the mineral soil as a seedbed for natural reproduction. Controlled burning encourages the growth of grass and forbs that help to support wildlife, such as deer, turkey, and quail. Prescribed burning reduces the hazard of wildfire by reducing the underbrush.

Markets are plentiful for the wood produced in Clay County. Pulpwood mills, chip and sawmills, and wood product mills in Clay County and surrounding areas create a great demand for wood.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to fertilization than others, and some are more susceptible to erosion after roads are built and timber is harvested. Some soils require special efforts to reforest. In the section "Detailed Soil Map Units," each map unit in the survey area suitable for producing timber presents information about productivity, limitations for harvesting timber, and management concerns for producing timber. The common forest understory plants are also listed. Table 6 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate*, and *severe* are used to indicate the degree of the major soil limitations to be

Figure 12 —Hurricane fine sand, 0 to 5 percent slopes, is moderately suited to commercial production of slash pine.

considered in forest management.

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

Table 6 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation for use and management. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *S* indicates a dry, sandy soil.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation activities or harvesting operations expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings

of *moderate* or *severe* indicate the need for construction of higher standard roads, additional maintenance of roads, additional care in planning of harvesting and reforestation operations, or use of specialized equipment.

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

Figure 13.—Blackgum trees in an area of Allanton and Rutlege mucky fine sands, depressional. These trees are valuable for wetland wildlife. They have some commercial value.

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

Ratings of *windthrow hazard* consider the likelihood of trees being uprooted by the wind. Restricted rooting depth is the main reason for windthrow. Rooting depth can be restricted by a high water table, fragipan, or bedrock, or by a combination of such factors as soil wetness, texture, structure, and depth. The risk is *slight* if strong winds cause trees to break but do not uproot them; *moderate* if strong winds cause an occasional tree to be blown over and many trees to break; and *severe* if moderate or strong winds commonly blow trees over. Ratings of *moderate* or *severe* indicate the need for care in thinning or possibly not thinning. Specialized equipment may be needed to avoid damage to shallow root systems in partial cutting operations. A plan for periodic salvage of windthrown trees and the maintenance of a road and trail system may be needed.

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. *Plant competition* becomes more severe on the more productive soils, on poorly drained soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants reduces adequate natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants reduces natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensively prepared and maintained. A *moderate* or *severe* rating indicates the need for site preparation to ensure the development of an adequately stocked stand. Managers must plan site preparation measures to ensure reforestation without delays.

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

The soils that are commonly used to produce timber have the yield predicted in meters. The yield is predicted at the point where mean annual increment culminates.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years. This index applies to fully stocked, even-aged, unmanaged stands. The procedure and technique for determining site index are given in the site index tables used for this survey *(6, 8, 13)*.

The *productivity class* represents an expected volume produced by the most important trees, expressed in cubic meters per hectare per year. Cubic meters per hectare can be converted to cubic feet per acre by multiplying by 14.3. It can be converted to board feet by multiplying by a factor of about 71. For example, a productivity class of 8 means the soil can be expected to produce 114 cubic feet per acre per year at the point where mean annual increment culminates, or about 568 board feet per acre per year.

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

Grazeable Woodland

R. Gregory Hendricks, range conservationist, Soil Conservation Service, helped to prepare this section.

Clay County has 316,483 acres of woodland *(11)*, much of which has high potential for grazing. Many of the smaller, privately owned woodland tracts are fenced and used by livestock; however, most of the larger woodland tracts owned by the timber companies are not fenced and, therefore, are not grazed. Large tracts in the Camp Blanding Military Reservation Wildlife Management Area have perimeter fencing and could be grazed at this time.

Grazeable woodland is forest that has an understory

of native grasses, legumes, forbs, and shrubs. The understory is an integral part of the forest plant community. The native plants can be grazed without significantly impairing other forest values. On such woodland, grazing is compatible with timber management if it is controlled or managed so that timber and forage resources are maintained or enhanced. The native forages in woodland areas are readily available to livestock producers and is an economic grazeable resource. Integrating woodland and grazing management offers opportunities to obtain income from the land during the life of the pine stand.

Clay County has two major grazeable woodland sites, the North Florida Flatwoods and the Longleaf Pine-Turkey Oak Hills. Important native forage for livestock is chalky bluestem and indiangrass on the North Florida Flatwoods grazeable woodland site. Annual forbs, ground blueberry, gallberry, and a variety of sedges and rushes provide excellent food for wildlife. Important native forage for livestock on the Longleaf Pine-Turkey Oak Hills site consists of indiangrass and a variety of panicums and bluestems. Annual forbs and associated species, sedges, and a variety of browse plants provide most of the food for wildlife on the Longleaf Pine-Turkey Oak Hills site.

Forage production on grazeable woodland varies according to specific sites. The amount of shade cast by the canopy, the accumulation of fallen needles, the influence of time and intensity of grazing on the forage, and the number, size, spacing, and method of site preparation for tree planting affect potential grazing capacity. Suggested annual stocking rates range from 8 to 30 acres per cow on soils that have a high water table, such as Leon, Plummer, and Ocilla soils. On droughty soils, such as Penney, Blanton, and Troup soils, stocking rates range from 20 to 60 acres per cow annually. Newly planted pine stands can be grazed the second growing season following planting. Maximum forage yields (table 7) can be expected through the twelfth year of the pine stand; whereas, annual forage production will begin to diminish as the forest canopy begins to close under traditional planting methods. Innovative pine spacing techniques, such as double rows of trees separated by 30- to 60-foot spaces without trees, have allowed forest producers to maintain an acceptable level of pulp production while extending their grazeable resources throughout the rotation of the timber. Presently, the best combination of forest management and woodland grazing has occurred when pines are planted on double rows of 4 by 8 feet (trees 8 feet apart within the row) separated by a 40-foot space that is managed for forage production.

Recreation

Clay County offers a variety of recreational activities *(3)*. The county has many lakes, including Doctor's, Asbury, Brooklyn, Geneva, and Smith Lakes; and creeks, including Black, Governor's, and Peter's Creeks that provide for unlimited outdoor recreational activity.

Clay County is bordered on the east by the St. Johns River (fig. 14) that offers many opportunities for water sport enthusiasts. The lakes and beaches in the Keystone Heights and Kingsley Lake areas also provide facilities for boating, swimming, and other water activities.

Clay County has numerous parks and playgrounds for public use. Fishing, boating, swimming, camping, picnicking, and hunting are some of the more popular activities. Goldhead Branch State Park has facilities for all of these activities except hunting and also has nature trails, nature study participation programs, and campfire activities. During the hunting season, Camp Blanding Military Reservation Wildlife Management Area has designated areas for hunting.

Recreational activities for more organized sports are available throughout the county. Schools, churches, and civic groups sponsor many of these activities.

In table 8, the soils of the survey area are rated according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, 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 soil reclamation, special design, intensive

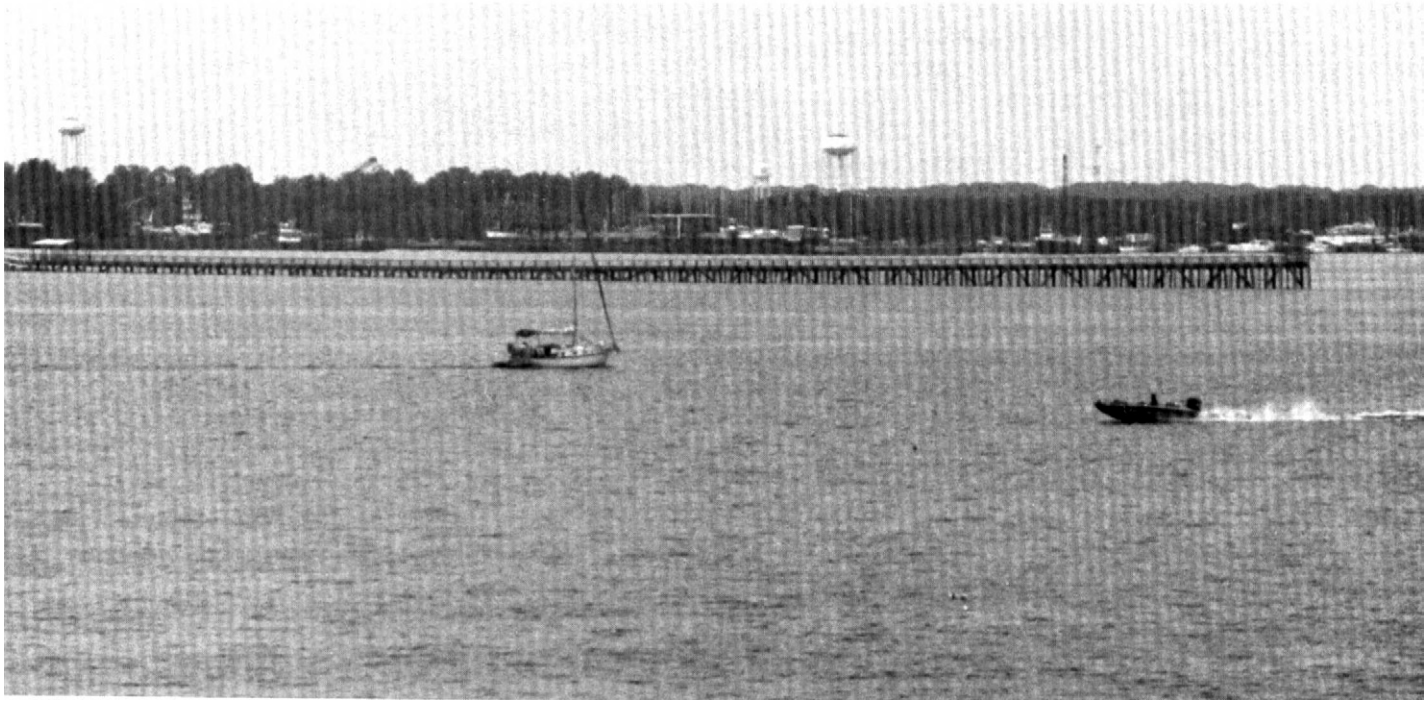


Figure 14.—The St. Johns River is on the eastern border of Clay County. It provides many outdoor recreational activities for the year-round resident and tourist population of the county.

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

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

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

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

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

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

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

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

Wildlife is a valuable resource in Clay County. Urban development, especially in the area from Orange Park to Green Cove Springs, has been detrimental to wildlife habitat, but the majority of the county still supports a large variety and number of wildlife.

Game species include white-tailed deer, squirrels, turkey, bobwhite quail, and waterfowl. Nongame species include raccoon, rabbit, armadillo, opossum, skunk, bobcat, gray fox, red fox, otter, and a variety of songbirds, wading birds, woodpeckers, reptiles, and amphibians.

Areas of particular importance to wildlife are along the St. Johns River in the 77,000 acre Camp Blanding Wildlife Management Area and in the 1,500 acre Goldhead Branch State Park. Woodland acreages, which are owned by large companies, also provide valuable habitat for wildlife.

The St. Johns River and the large sandhill lakes in the western part of the county provide good fishing. Important species in the St. Johns River and sandhill lakes include largemouth bass, bream, black crappie or speckled perch, and catfish. In addition, striped bass and mullet are in the St. Johns River.

A number of endangered and threatened species are in Clay County. These include the red-cockaded woodpecker and the bald eagle. A detailed list of these species with information on range and habitat needs is available from the district conservationist at the local Soil Conservation Service office.

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 9, 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, browntop millet, dove praso millet, wheat, oats, and grain sorghum.

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, lovegrass, Florida beggarweed, hairy indigo, aeschynomene, clover, and sesbania.

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 bluestem, goldenrod, beggarweed, partridge pea, and bristlegrass.

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, palmetto, cherry, sweetgum,

wildgrape, hawthorn, dogwood, persimmon, hickory, blackberry, gallberry, waxmyrtle, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are firethorn, wild plum, and blackberry.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, cypress, fir, cedar, and juniper.

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

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

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

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

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, egrets, herons, shore birds, otter, mink, and sandhill cranes.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include deer, bobwhite quail, and meadowlark.

Engineering

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

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

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

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

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

This information can be used to: evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan

detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

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

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

Building Site Development

Table 10 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 favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are moderately favorable for the indicated use and special planning, design, or maintenance may be needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or 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. Depth to a high water table, depth to bedrock or 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, depth to a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, depth to a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 11 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 favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are moderately favorable for the indicated use and special planning, design, or maintenance may be 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 11 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

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

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

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

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, depth to bedrock 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, bedrock, 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 11 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, depth to a 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 revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability,

more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

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

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

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

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

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

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

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

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

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

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

Soils rated *poor* are very sandy or clayey, have less

than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and releases a variety of plant-available nutrients as it decomposes.

Water Management

Table 13 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 moderately favorable for the indicated use and special planning, design, or maintenance may be needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

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

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

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

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

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material 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 the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock 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 bedrock or 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 20.

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

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

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

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

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

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

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

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

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20, or higher, for the poorest. The AASHTO classification for soils tested, with group index numbers

in parentheses, is given in table 20.

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

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

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

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

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

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓ bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

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

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

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

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

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

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The

change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

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

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 20 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 20 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.

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

In table 15, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

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

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

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

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

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

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These

consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

In table 16, some soils are assigned to two hydrologic soil groups. Soils that have a seasonal high water table but can be drained are assigned first to a hydrologic group that denotes the drained condition of the soil and then to a hydrologic group that denotes the undrained condition, for example, B/D. Because there are different degrees of drainage and water table control, onsite investigation is needed to determine the hydrologic group of the soil in a particular location.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 16 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (there is a near 0 to 5 percent chance of flooding in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (there is a 5 to 50 percent chance of flooding in any year). *Frequent* means that flooding occurs often under normal weather conditions (there is more than a 50 percent chance of flooding in any year). Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. November-May, for example, means that flooding can occur during the period November through May. About two-thirds to three-fourths of all flooding occurs during the stated period.

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

Also considered 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 16 are the depth to the seasonal high water table; the kind of water table, that is, *perched*, or *apparent;* and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 16.

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

The two numbers in the "High water table—Depth" column indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. Table 16 shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Not shown in the table is subsidence caused by an imposed surface load or by the withdrawal of ground water throughout an extensive area as a result of lowering the water table.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion

of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severely corrosive environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

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

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

Physical, Chemical, and Mineralogical Analyses of Selected Soils

Dr. Victor W. Carlisle and Dr. Mary E. Collins, professor and assistant professor of Soil Science, respectively, University of Florida, Soil Science Department, helped to prepare this section.

Parameters for physical, chemical, and mineralogical properties of representative pedons sampled in Clay County are presented in tables 17, 18, and 19. The analyses were conducted and coordinated by the Soil Characterization Laboratory at the University of Florida. Detailed profile descriptions of the analyzed soils are given in alphabetical order in the section "Classification of the Soils." Laboratory data and profile information for additional soils in Clay County, as well as for other counties in Florida, are on file at the University of Florida, Soil Science Department.

Typifying pedons were sampled from pits at carefully selected locations. Samples were air-dried, crushed, and sieved through a 2-millimeter screen. Most analytical methods used are outlined in Soil Survey Investigations Report No. 1 *(12)*.

Particle-size distribution was determined using a modified pipette method with sodium hexametaphosphate dispersion. Hydraulic conductivity and bulk density were determined on undisturbed soil cores. Water retention parameters were obtained from duplicate undisturbed soil cores placed in tempe pressure cells. Weight percentages of water retained at 100 centimeters water (1/10 bar) and 345 centimeters water (1/3 bar) were calculated from volumetric water percentages divided by bulk density. Samples were ovendried and ground to pass a 2-millimeter sieve, and the 15-bar water retention was determined. Organic carbon was determined by a modification of the Walkley-Black wet combustion method.

Extractable bases were obtained by leaching soils with normal ammonium acetate buffered at pH 7.0. Sodium and potassium in the extract were determined by flame emission. Calcium and magnesium were determined by atomic absorption spectrophotometry. Extractable acidity was determined by the barium chloride-triethanolamine method at pH 8.2. The sum of cations, which may be considered a measure of cation-exchange capacity, was calculated by adding the values for extractable bases and extractable acidity. Base saturation is the ratio of extractable bases to cation-exchange capacity expressed in percent. The pH measurements were made with a glass electrode using a soil-water ratio of 1:1; a 0.01 molar calcium chloride solution in a 1:2 soil-solution ratio; and normal potassium chloride solution in a 1:1 soil-solution ratio.

Electrical conductivity determinations were made with a conductivity bridge on 1:1 soil to water mixtures. Iron and aluminum extractable in sodium dithionite-citrate were determined by atomic absorption spectrophotometry. Aluminum, carbon, and iron were extracted from probable spodic horizons with 0.01 molar sodium pyrophosphate. Determination of aluminum and iron was by atomic absorption, and determination of extracted carbon was by the Walkley-Black wet combustion method. Mineralogy of the clay fraction less than 2 microns was ascertained by x-ray diffraction. Peak heights at 18 angstrom, 14 angstrom, 7.2 angstrom, and 4.31 angstrom positions represent montmorillonite, interstratified expandable vermiculite or 14 angstrom intergrades, kaolinite, and quartz, respectively. Peaks were measured, summed, and normalized to give the percent of soil minerals identified in the x-ray diffractograms. These percentage values do not indicate absolute determined quantities of soil minerals but do imply a relative distribution of minerals in a particular mineral suite. Absolute percentages would require additional knowledge of particle size, crystallinity, unit structure substitution, and matrix problems.

The inherently sandy nature of most soils in Clay County (table 17) is readily apparent. With the exception of Meggett and Pelham soils, all other pedons sampled had one or more horizons in which the total sand content exceeded 90 percent. Centenary, Hurricane, Leon, Ortega, Penney, Pottsburg, and Ridgewood soils contained more than 90 percent sand to a depth of 2 meters or more. One horizon in Blanton and Mandarin soils and two horizons in Albany,

Meadowbrook, and Newnan soils contained less than 90 percent sand.

Deeper horizons in Albany, Blanton, Meadowbrook, Meggett, Newnan, and Pelham soils contained larger amounts of clay, ranging from 10.1 to 42 percent. In addition, Meggett and Pelham soils had high clay content in a combined horizon that was more than 1 meter thick.

Silt content was generally less than 5 percent; however, it exceeded 10 percent in one horizon of Mandarin soils, in four horizons of Pelham soils, and in all horizons of Meggett soils. Silt content was less than 2.5 percent in all horizons of Ortega, Penney, and Ridgewood soils.

Fine sand dominated the sand fractions in Albany, Blanton, Centenary, Hurricane, Leon, Mandarin, Meggett, Newnan, Ortega, Penney, Pottsburg, and Ridgewood soils. All of the soils sampled, except for Meadowbrook, Meggett, and Pelham soils, had horizons that contained more than 70 percent fine sand. Centenary, Hurricane, Leon, Ortega, and Pottsburg soils contained more than 80 percent fine sand. Medium sand dominated the sand fractions in Meadowbrook soils, and very fine sand dominated the sand fractions in Pelham soils. Measurable amounts of very coarse sand were only in Meadowbrook and Meggett soils. The content of coarse sand was generally less than 1 percent; however, Meadowbrook, Penney, and Ridgewood soils exceeded this amount. The content of very fine sand was generally less than 10 percent; however, all horizons of Albany, Meadowbrook, Newnan, and Pelham soils and all but the deepest horizon of Meggett soils greatly exceeded this value. Droughtiness is a common characteristic of sandy soils, particularly of those that are moderately well drained, well drained, or excessively drained.

Hydraulic conductivity values frequently ranged between 10 and 35 centimeters per hour; however, Blanton, Hurricane, Newnan, Ortega, Pelham, Penney, and Ridgewood soils had horizons with values of more than 40 centimeters per hour. The relatively high clay content that is in Meggett soils and in the deeper horizons of Albany, Blanton, Meadowbrook, and Pelham soils resulted in hydraulic conductivity values of 1 centimeter or less per hour. Design and function of septic tank absorption fields are affected by such low hydraulic conductivity values. Pottsburg soils had well developed spodic horizons that have low hydraulic conductivity values. The spodic horizons in Centenary, Hurricane, Leon, Mandarin, and Newnan soils had higher hydraulic conductivity values than are generally recorded for these horizons in most Florida soils. The available water for plants can be estimated from bulk density and water content data. Soils that have an excessive content of sand, such as Ortega fine sand, retain very low amounts of available water; conversely, soils that have a higher amount of fine-textured materials and a higher content of organic matter, such as Meggett sandy loam, retain much larger amounts of available water.

Chemical soil properties (table 18) show that a very low amount of extractable bases was present in most Clay County soils. All horizons of Albany, Centenary, Hurricane, Leon, Mandarin, Newnan, Ortega, Penney, Pottsburg, and Ridgewood soils contained less than 1 milliequivalent per 100 grams extractable bases. Meggett and Pelham soils had horizons that contained more than 5 milliequivalents per 100 grams extractable bases. The mild, humid climate of Clay County results in depletion of basic soil cations (calcium, magnesium, sodium, and potassium) through leaching.

Calcium was the dominant base in all horizons of most soils sampled; however, more magnesium than calcium occurred in the deeper horizons of Pelham soils. Some horizons in Meadowbrook, Meggett, and Pelham soils contained more than 1 milliequivalent per 100 grams extractable calcium. Extractable magnesium occurred in amounts of more than the 1 milliequivalent per 100 grams in a few deeper horizons of Blanton, Meggett, and Pelham soils. Detectable amounts of magnesium occurred in all horizons of all other pedons. Sodium generally occurred in amounts of less than 0.1 milliequivalent per 100 grams; however, one horizon or more in Meadowbrook, Meggett, Newnan, Pelham, and Pottsburg soils exceeded this amount. All soils sampled contained detectable amounts of sodium throughout the pedons. Most Clay County soils contained less than 0.1 milliequivalent per 100 grams potassium. Meggett and Pelham soils had a few horizons that exceeded this amount. All soils had one or more horizons with 0.02 or less milliequivalents per 100 grams extractable potassium.

Values for cation-exchange capacity, an indication of plant nutrient capacity, exceeded 10 milliequivalents per 100 grams in the surface layer of Mandarin, Meadowbrook, and Pelham soils. Cation-exchange capacity exceeded 10 milliequivalents per 100 grams in the argillic horizons of Meggett and Pelham soils and in the spodic horizons of Leon, Mandarin, Newnan, and Pottsburg soils. Soils, such as Albany soils, that have low cation-exchange capacities in the surface layer require only small amounts of lime to significantly alter the base status and soil reaction. Generally, soils of low inherent soil fertility are associated with low values for

extractable bases and low cation-exchange capacities, and fertile soils are associated with high values for extractable bases, high base saturation values, and high cation-exchange capacities.

The content of organic carbon was less than 1 percent in Albany, Blanton, Hurricane, Ortega, and Ridgewood soils. The surface layer of Meggett, Newnan, and Pelham soils contained more than 1.5 percent organic carbon. The surface layer of Centenary, Mandarin, Meadowbrook, and Penney soils contained between 1 and 1.5 percent organic carbon. The spodic horizon of Centenary, Hurricane, Leon, Mandarin, Newnan, and Pottsburg soils contained enhanced amounts of organic carbon that range from 0.34 to 2.43 percent. In the other soils, the content of organic carbon decreased rapidly as depth increased. Since the content of organic carbon in the surface layer is directly related to soil nutrient and water retention capacities of sandy soils, management practices that conserve and maintain the amounts of organic carbon are highly desirable.

Electrical conductivity values were all very low, ranging from nondetectable amounts in many horizons to 0.21 millimhos per centimeter in the Bh2 horizon of the Pottsburg soils. These data indicate that the content of soluble salt in soils sampled in Clay County was insufficient to detrimentally affect the growth of salt-sensitive plants.

Soil reaction in water generally ranged between pH 4.0 and 5.5, with slightly higher or lower values in a few horizons. Soil reaction values were frequently lower, in the order of 1.0 pH unit or less, when determined in potassium chloride and calcium chloride solutions than in water. Maximum plant nutrient availability is generally attained when soil reaction is between pH 6.5 and 7.5; however, under Florida conditions, maintaining soil reaction above pH 6.5 is not economically feasible for most agricultural production purposes.

The ratio of pyrophosphate extractable carbon and aluminum to clay in the Bh horizon of Centenary, Leon, Newnan, and Pottsburg soils was sufficient to meet the chemical criteria for spodic horizons. Field morphology was used to determine spodic horizons in Hurricane and Mandarin soils. The Bh horizon in these soils did not meet all chemical criteria for spodic horizons. Sodium pyrophosphate extractable iron was 0.03 percent or less in the spodic horizon in all of these soils.

Citrate-dithionite extractable iron in the argillic horizon of Ultisols ranged from 0.03 percent in Meggett soils to 1.08 percent in Pelham soils. Similarly, these values in the Bh horizon of Spodosols ranged from 0.03 percent in Newnan soils to 0.10 percent in Hurricane and Leon soils. Aluminum extracted by citrate-dithionite from the Bt horizon ranged from 0.03 percent in Meggett soils to 0.15 percent in Albany and Pelham soils. The amounts of iron and aluminum in Clay County soils were not sufficient to detrimentally affect phosphorus availability.

Sand fractions of 2 to 0.05 millimeters were siliceous, and quartz was overwhelmingly dominant in all pedons. Varying amounts of heavy minerals occurred in most horizons with greatest concentrations in the very fine sand fraction. No weatherable minerals were observed. Crystalline mineral components of the clay fraction of less than 0.002 millimeter are reported in table 19 for major horizons of the pedons sampled. The clay mineralogical suite was composed of montmorillonite, a 14 angstrom intergrade, kaolinite, and quartz.

Montmorillonite was not detected in Blanton, Hurricane, Meadowbrook, Ortega, and Ridgewood soils. The 14 angstrom intergrade occurred in all pedons sampled. Kaolinite occurred in all other horizons for which determinations for clay identification were performed except in the surface layers of Mandarin and Newnan soils and in the Bh2 horizon of Pottsburg soils. All pedons contained varying amounts of quartz.

Montmorillonitic clay, dominant in Clay County soils, is probably the least stable mineral component in the present acidic environment. Large amounts of montmorillonite were in the deeper horizons of Pelham soils and were throughout Meggett soils. Considerable volume change could result from shrinking when dry and swelling when wet of montmorillonitic soil materials that have a high content of clay. The occurrence of relatively large amounts of 14 angstrom intergrades and the general, although inconsistent, tendency of these minerals to decrease as pedon depth increases suggest that the 14 angstrom intergrade minerals are among the most stable species in this weathering environment. Kaolinite occurred erratically throughout all deep, sandy pedons, indicating that these soils were formed from severely weathered parent material. Clay-size quartz has primarily resulted from decrements of the silt fraction. Soils dominated by montmorillonite and 14 angstrom intergrades have much higher cation-exchange capacity and retain more plant nutrients than soils dominated by kaolinite and quartz. Clay mineralogy of Clay County soils influences use and management less frequently than the total clay content.

Engineering Index Test Data

Table 20 shows laboratory test data for several

pedons sampled at carefully selected sites in the county. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." The soil samples were tested by the Florida Department of Transportation, Soils Laboratory, Bureau of Materials and Research.

The testing methods 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); Unifed classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); and Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM).

Table 20 contains engineering test data about some of the major soils in Clay County. These tests help evaluate the soils for engineering purposes. The classifications given are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits.

The mechanical analyses were made by the combined sieve and hydrometer method. The various grain-size fractions were calculated on the basis of all the material in the soil sample, including that coarser than 2 millimeters in diameter. These mechanical analyses should not be used in naming textural classes of soils.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of the soil material. As the moisture content of a dry, clayey soil is increased, the material changes from a dry state to a semisolid state to a plastic state. If the moisture content is further increased, the material changes from plastic to liquid. The plastic limit is the moisture content at which the soil material changes from a semisolid state to a plastic state, and the liquid limit is the moisture content at which the soil material changes from a plastic state to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which soil material is plastic. The data on liquid limit and plasticity index in table 20 are based on laboratory tests of soil samples.

Compaction, or moisture-density, data are important in earthwork. If soil material is compacted at a successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, density decreases with an increase in moisture content. The highest dry density obtained in the compactive test is termed maximum dry density. As a rule, maximum strength of earthwork is obtained if the soil is compacted to the maximum dry density.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(10)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 21 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is 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 Haplaquents (*Hapl*, meaning minimal horizonation, plus *aquent*, the suborder of the Entisols that has 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 Haplaquents.

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

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

Soil Series and Their Morphology

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

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual (9)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (10)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

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

Albany Series

The Albany series consists of nearly level to gently sloping, somewhat poorly drained soils that formed in thick beds of loamy marine sediment. These soils are in broad areas on the gently rolling uplands and on slight knolls on the flatwoods. A high water table is at a depth of 12 to 30 inches for 1 to 4 months during most years. The slopes range from 0 to 5 percent. These soils are loamy, siliceous, thermic Grossarenic Paleudults.

Albany soils are geographically associated with Blanton, Centenary, Hurricane, Meadowbrook, Ocilla, and Ridgewood soils. Blanton soils are moderately well drained. Centenary and Hurricane soils have a spodic horizon. In addition, Centenary soils are moderately well drained. Meadowbrook soils are poorly drained. Ocilla soils have an argillic horizon at a depth of 20 to 40 inches. Ridgewood soils are sandy to a depth of 80 inches or more.

Typical pedon of Albany fine sand, 0 to 5 percent slopes; 4 miles east of Clay County Road 217, 2.1 miles south of Duval County line; 1,600 feet west and 300 feet south of the northeast corner of NW¼NE¼ sec. 18, T. 4 S., R. 24 E.

A—0 to 6 inches; very dark gray (10YR 3/1) fine sand; weak medium granular structure; very friable; few fine and medium roots; extremely acid; clear wavy boundary.

E1—6 to 16 inches; brown (10YR 5/3) fine sand; few medium distinct light gray (10YR 7/2) mottles; single grained; loose; few fine and medium roots; few charcoal fragments; extremely acid; clear wavy boundary.

E2—16 to 39 inches; very pale brown (10YR 7/3) fine sand; common medium distinct brownish yellow (10YR 6/6) mottles; very dark gray root stains; single grained; loose; few fine and medium roots; very strongly acid; clear wavy boundary.

E3—39 to 47 inches; light gray (10YR 7/2) fine sand; common medium distinct brownish yellow (10YR 6/6) mottles; single grained; loose; extremely acid; abrupt wavy boundary.

Bt—47 to 60 inches; brownish yellow (10YR 6/6) fine sandy loam; many fine distinct strong brown (7.5YR 5/6) mottles, common medium distinct gray (10YR 6/2) mottles, and few fine prominent red (2.5YR 5/6) mottles; weak subangular blocky structure; friable; extremely acid; gradual wavy boundary.

Btg—60 to 80 inches; light gray (10YR 7/1) sandy clay loam; many coarse prominent brownish yellow (10YR 6/6) mottles and common coarse prominent red (2.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; extremely acid.

The thickness of the solum is 60 inches or more. The reaction ranges from extremely acid to medium acid except in the A horizon that ranges from extremely acid to slightly acid.

The A or Ap horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. This horizon is 6 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 2 to 6 and in places has mottles. The texture is sand or fine sand. The thickness of this horizon is 40 to 70 inches.

The Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 6. Mottles are in various shades of gray, yellow, red, and brown or are a mixture of these colors. The texture is fine sandy loam, sandy loam, or sandy clay loam. The Bt horizon is 6 to 13 inches thick. The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 2 or less and has mottles. The texture is sandy loam or sandy clay loam.

Allanton Series

The Allanton series consists of nearly level, very poorly drained soils that formed in thick marine sediment. These soils are in drainageways on the flatwoods. A high water table is within 12 inches of the surface for 3 to 5 months and is near or on the surface for 1 to 3 months in some years. It is generally within 24 inches of the surface for the rest of the year. Flooding occurs in most years. The slopes are 0 to 2 percent. These soils are sandy, siliceous, thermic Grossarenic Haplaquods.

Allanton soils are geographically associated with Leon, Lynn Haven, Mandarin, Ortega, Osier, Ridgewood, and Rutlege soils. Leon, Lynn Haven, and Mandarin soils have a spodic horizon at a depth of less than 30 inches and are better drained than Allanton soils. Ortega, Osier, Ridgewood, and Rutlege soils do not have a spodic horizon. In addition, Ortega, Osier, and Ridgewood soils are better drained than Allanton soils.

Typical pedon of the Allanton fine sand, frequently flooded; approximately 3.2 miles north of Florida State Highway 16, 2.1 miles east of Clay-Bradford County line; 400 feet north and 400 feet east of the southwest corner of sec. 28, T. 5 S., R. 23 E.

A1—0 to 12 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; friable; many

fine and medium roots; many uncoated sand grains; very strongly acid; gradual wavy boundary.

A2—12 to 18 inches; very dark grayish brown (10YR 3/2) fine sand; weak fine granular structure; friable; common fine and medium roots; very strongly acid; clear wavy boundary.

E1—18 to 26 inches; dark gray (10YR 4/1) fine sand; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

E2—26 to 56 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; very strongly acid; abrupt wavy boundary.

Bh1—56 to 63 inches; very dark grayish brown (10YR 3/2) fine sand; single grained; loose; about 50 percent coated sand grains; very strongly acid; gradual wavy boundary.

Bh2—63 to 80 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very strongly acid.

The solum is fine sand or sand to a depth of 80 inches or more except for the surface layer, which may also be mucky fine sand. The reaction is very strongly acid or strongly acid in the A and E horizons and extremely acid to strongly acid in the Bh horizon. Depth to the Bh horizon is 50 to 80 inches.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. This horizon is 10 to 20 inches thick.

The E horizon has hue of 10YR, value of 4 to 7, and chroma of 2 or less. This horizon is 34 to 42 inches thick.

The Bh1 horizon has hue of 7.5YR or 10YR, value of 2 to 5, and chroma of 2 or less. This horizon is 3 to 10 inches thick. The Bh2 horizon has hue of 10YR, 7.5YR, or 5YR, value of 2 or 3, and chroma of 2 or less.

Blanton Series

The Blanton series consists of nearly level to moderately sloping, moderately well drained soils that formed in thick beds of sandy and loamy marine sediment. These soils are on low ridges and knolls and in broad, gently rolling upland areas. Where slopes are 0 to 5 percent, the high water table is at a depth of 60 to 72 inches for 1 to 3 months during most years. Where slopes are 5 to 8 percent, it is at a depth of 30 to 48 inches for 1 to 4 months. The slopes range from 0 to 8 percent. These soils are loamy, siliceous, thermic Grossarenic Paleudults.

Blanton soils are geographically associated with Albany, Ocilla, Ortega, Penney, and Ridgewood soils. Albany and Ocilla soils are somewhat poorly drained. In addition, Ocilla soils have sandy A and E horizons 20 to 40 inches thick. Ortega, Penney, and Ridgewood soils have sandy texture to a depth of more than 80 inches. In addition, Penney soils have lamellae at a depth of more than 50 inches, and Ridgewood soils are somewhat poorly drained.

Typical pedon of Blanton fine sand, 0 to 5 percent slopes; 1.5 miles southwest of Atlantic Coastline Railroad track, 200 feet south of U.S. Highway 17; 600 feet north and 3,000 feet east of the northwest corner of sec. 34, T. 6 S., R. 26 E.

A—0 to 6 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; many fine roots; very strongly acid; gradual wavy boundary.

E1—6 to 20 inches; very pale brown (10YR 7/4) fine sand; single grained; loose; common medium and fine roots; few charcoal pebbles; strongly acid; gradual wavy boundary.

E2—20 to 46 inches; very pale brown (10YR 7/3) fine sand; few fine faint light gray mottles in the lower part of the horizon; single grained; loose; common fine roots; few charcoal pebbles; medium acid; gradual wavy boundary.

E3—46 to 58 inches; very pale brown (10YR 7/3) fine sand; many fine prominent yellowish brown (10YR 5/8) mottles and many medium faint very pale brown (10YR 7/4) mottles; single grained; common fine roots; very strongly acid; clear wavy boundary.

Bt—58 to 80 inches; pale brown (10YR 6/3) in the upper 3 inches grading to light gray (10YR 7/2) sandy clay loam with many coarse prominent red (2.5YR 5/6) mottles and common medium distinct brownish yellow (10YR 6/6) mottles; common medium faint white streaks; moderate medium subangular blocky structure; very friable; very strongly acid.

The thickness of the solum is 80 inches or more. The reaction ranges from very strongly acid to medium acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. This horizon is 6 to 10 inches thick.

The E1 and E2 horizons have hue of 10YR, value of 6 or 7, and chroma of 3 to 8. The E3 horizon has hue of 10YR, value of 6 or 7, and chroma of 2 to 4. In places, this horizon has mottles in shades of gray, yellow, and brown. Some pedons do not have an E3 horizon. Some pedons have an E4 horizon that has the same colors as the E3 horizon. The thickness of the E horizon ranges from 34 to 70 inches. The texture is fine sand or sand.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 6; or hue of 10YR, value of 7, and chroma of 2 to 6. In places, this horizon has gray, red, yellow, and brown mottles. The texture is sandy loam or sandy clay loam.

Centenary Series

The Centenary series consists of nearly level to gently sloping, moderately well drained soils that formed in beds of sandy marine sediment. These soils are on slightly high, slightly convex, broad ridges on the flatwoods. The high water table is at a depth of 42 to 60 inches for 1 to 4 months during most years and at a depth of 60 inches the rest of the year. The slopes range from 0 to 5 percent. These soils are sandy, siliceous, thermic Grossarenic Entic Haplohumods.

Centenary soils are geographically associated with Albany, Blanton, Hurricane, Ortega, and Ridgewood soils. Albany and Blanton soils have an argillic horizon at a depth of 40 to 80 inches, and they do not have a spodic horizon. In addition, Albany soils are somewhat poorly drained. Hurricane and Ridgewood soils are somewhat poorly drained. In addition, Ridgewood soils do not have a spodic horizon. Ortega soils do not have a spodic horizon.

Typical pedon of Centenary fine sand, 0 to 5 percent slopes; about 400 feet north of Florida State Highway 16, 600 feet west of Clay County Road 315 and Florida State Highway 16 junction; 400 feet north and 2,100 feet east of the southwest corner of sec. 7, T. 6 S., R. 26 E.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) fine sand; single grained; loose; many uncoated sand grains; many fine and medium roots; extremely acid; clear wavy boundary.

E1—5 to 10 inches; brown (10YR 5/3) fine sand; single grained; loose; few fine fragments of black (10YR 2/1) charcoal; few fine and medium roots; extremely acid; gradual wavy boundary.

E2—10 to 35 inches; very pale brown (10YR 7/3) fine sand; single grained; loose; few fragments of black (10YR 2/1) charcoal; few faint brown (10YR 5/3) mottles; few fine and medium roots; extremely acid; gradual wavy boundary.

E3—35 to 43 inches; very pale brown (10YR 7/3) fine sand; single grained; loose; common distinct yellowish brown (10YR 5/6, 5/8) mottles and few faint light gray mottles; very strongly acid; gradual wavy boundary.

E4—43 to 54 inches; light gray (10YR 7/2) fine sand; single grained; loose; few fine concretions of dark red (2.5YR 3/6) ironstone; very strongly acid; clear wavy boundary.

Bh1—54 to 60 inches; dark reddish gray (5YR 4/2) fine sand; single grained; loose; few medium and coarse roots; extremely acid; gradual wavy boundary.

Bh2—60 to 80 inches; dark reddish brown (5YR 3/2) fine sand; single grained; loose; many organic coated sand grains; extremely acid.

The thickness of the solum is 60 to 80 inches or more. Depth to the Bh horizon is more than 50 inches. The reaction ranges from extremely acid to medium acid.

The Ap or A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. This horizon is 5 to 8 inches thick.

The upper part of the E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 8. In places, this part of the horizon has mottles in shades of brown, gray, or yellow. The lower part has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. The texture of the E horizon is sand or fine sand. This horizon is 46 to 70 inches thick.

The Bh horizon has hue of 5YR, 7.5YR, or 10YR, value of 2 to 4, and chroma of 1 or 2. The texture is sand or fine sand.

Some pedons have a C horizon that has hue of 10YR, value of 4 to 6, and chroma of 1 to 3.

Goldhead Series

The Goldhead series consists of nearly level, poorly drained soils that formed in thick beds of stratified unconsolidated loamy and sandy marine sediment. These soils are in broad areas on the flatwoods. A high water table is within 12 inches of the surface for 2 to 5 months during most years. The slopes range from 0 to 2 percent. These soils are loamy, siliceous, thermic Arenic Ochraqualfs.

Goldhead soils are geographically associated with Albany, Leon, Meadowbrook, Meggett, Ocilla, Osier, and Sapelo soils. All of the associated soils have low base saturation except Meadowbrook and Meggett soils. Albany and Ocilla soils are somewhat poorly drained. In addition, Albany soils have an argillic horizon at a depth of 40 to 80 inches. Leon and Sapelo soils have a spodic horizon. Meadowbrook soils have an argillic horizon at a depth of 40 to 80 inches. Meggett soils have an argillic horizon within 20 inches of the surface. Osier soils are sandy to a depth of 80 inches or more.

Typical pedon of Goldhead fine sand; about 1 mile south of the intersection of Florida State Highway 16 and U.S. Highway 17, 100 feet west of U.S. Highway 17, T. 6 S., R. 26 E.

A—0 to 6 inches; black (10YR 2/1) fine sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; gradual wavy boundary.

Eg1—6 to 12 inches; dark gray (10YR 4/1) fine sand; single grained; loose; few fine and medium roots; slightly acid; gradual wavy boundary.

Eg2—12 to 38 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; slightly acid; clear wavy boundary.

Btg1—38 to 45 inches; light brownish (10YR 6/2) sandy clay loam; many medium prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; neutral; gradual wavy boundary.

Btg2—45 to 51 inches; gray (10YR 6/1) fine sandy loam; few medium prominent strong brown (7.5YR 5/8) mottles and few fine distinct dark brown (10YR 4/3) mottles; weak medium granular structure; very friable; mildly alkaline; clear wavy boundary.

Cg1—51 to 71 inches; gray (N 6/1) fine sand; single grained; loose; small pockets of light gray fine sandy loam; mildly alkaline; gradual wavy boundary.

Cg2—71 to 80 inches; gray (10YR 5/1) fine sand; small pockets of greenish gray (5GY 5/1) fine sandy loam; single grained; loose; mildly alkaline.

The thickness of the solum ranges from 35 to 60 inches. The reaction ranges from strongly acid to mildly alkaline in the A and E horizons and from slightly acid to mildly alkaline in the B and C horizons.

The A or Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. This horizon is 6 to 9 inches thick.

The Eg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2; hue of 2.5Y, value of 4 to 6, and chroma of 2; or it is neutral and has value of 5 to 7. The texture is sand or fine sand. This horizon is 14 to 34 inches thick.

The Btg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2; hue of 2.5Y, value of 4 to 6, and chroma of 2; or it is neutral and has value of 4 to 7. The texture is sandy loam, fine sandy loam, or sandy clay loam. This horizon is 10 to 24 inches thick.

The Cg horizon has hue of 10YR, value of 4 to 8, and chroma of 1 or 2; or it is neutral and has value of 4 to 8. Some pedons have a 2Cg horizon that has hue of 10YR, value of 6 to 8, and chroma of 2 or less, and it contains 20 percent or less of shell fragments.

Hurricane Series

The Hurricane series consists of nearly level to gently sloping, somewhat poorly drained soils that formed in thick beds of marine deposits. These soils are in slightly high, convex areas on the broad flatwoods and along the lower slopes of the gently sloping uplands. A high water table is at a depth of 24 to 40 inches for 3 to 6 months during most years. It is at a depth of 10 to 24 inches for short periods of about 2 weeks or less during some years. The slopes range from 0 to 5 percent. These soils are sandy siliceous, thermic Grossarenic Entic Haplohumods.

Hurricane soils are geographically associated with Albany, Blanton, Centenary, Leon, Mandarin, and Ortega soils. Albany and Blanton soils have an argillic horizon at a depth of 40 to 80 inches, and they do not have a spodic horizon. In addition, Blanton soils are moderately well drained. Centenary and Ortega soils are moderately well drained and do not have a spodic horizon. Leon and Mandarin soils have a spodic horizon at a depth of less than 30 inches. In addition, Leon soils are poorly drained.

Typical pedon of Hurricane fine sand, 0 to 5 percent slopes; 200 feet east of Clay County Road 315, 2.5 miles south of Florida State Highway 16; 600 feet east and 250 feet north of southwest corner of sec. 30, T. 6 S., R. 26 E.

A—0 to 5 inches; gray (10YR 5/1) fine sand; salt and pepper appearance, unrubbed, and dark gray (10YR 4/1) fine sand, rubbed; weak fine granular structure; very friable; many fine and medium roots; extremely acid; clear wavy boundary.

E1—5 to 10 inches; brown (10YR 5/3) fine sand; grayish brown (10YR 5/2) splotches; single grained; loose; many fine and medium roots; extremely acid; gradual wavy boundary.

E2—10 to 29 inches; very pale brown (10YR 7/3) fine sand; white (10YR 8/2) clean sand grains; common fine faint yellow (10YR 7/6) root stains; single grained; loose; few coarse and common medium roots; very strongly acid; gradual wavy boundary.

E3—29 to 56 inches; white (10YR 8/2) fine sand; few fine faint dark yellowish brown mottles and many medium distinct yellowish red (5YR 5/8) mottles; single grained; loose; common medium roots; very strongly acid; clear wavy boundary.

Bh1—56 to 66 inches; dark brown (7.5YR 4/2) fine

sand; few medium distinct yellowish red (5YR 4/6) mottles; weak fine granular structure; very friable; sand grains well coated with organic matter; few fine roots; extremely acid; gradual wavy boundary.

Bh2—66 to 80 inches; black (5YR 2/1) fine sand; weak fine granular structure; very friable; sand grains well coated with organic matter; very strongly acid.

The texture of the soil is sand or fine sand to a depth of 80 inches or more. The surface is fine sand. The reaction ranges from extremely acid to medium acid.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 3. This horizon is 3 to 9 inches thick.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 to 4. In places, this horizon has mottles in shades of brown, gray, red, or yellow. Many of the sand grains are uncoated. The E horizon is 46 to 66 inches thick.

The Bh horizon has hue of 10YR to 5YR, value of 2 to 5, and chroma of 4 or less. The sand grains are well coated with organic matter.

Kershaw Series

The Kershaw series consists of nearly level to moderately sloping, excessively drained soils that formed in thick beds of sandy marine sediment. These soils are on broad ridges, knolls, and rolling uplands. A high water table is at a depth of more than 72 inches. The slopes range from 0 to 8 percent. These soils are thermic, uncoated Typic Quartzipsamments.

Kershaw soils are geographically associated with Ortega, Penney, and Troup soils. Ortega soils have a water table at a depth of 40 to 60 inches and are moderately well drained. Penney soils have lamellae at a depth of 50 inches. Troup soils have an argillic horizon at a depth of more than 40 inches and are well drained.

Typical pedon of Kershaw sand, 0 to 8 percent slopes; in Goldhead State Park, 3 miles north of Florida State Highway 214, 2.25 miles east of Florida State Highway 21; 1,300 feet north and 1,900 feet west of the southeast corner of sec. 1, T. 8 S., R 23 E.

A—0 to 4 inches; dark grayish brown (10YR 4/2) sand; single grained; loose; few fine roots; very strongly acid; clear wavy boundary.

C1—4 to 68 inches; brownish yellow (10YR 6/8) sand; single grained; loose; few fine roots; very strongly acid; clear wavy boundary.

C2—68 to 80 inches; yellow (10YR 7/6) sand; single grained; loose; very strongly acid.

The thickness of the sand is 80 inches or more. The content of silt plus clay is less than 5 percent between depths of 10 to 40 inches. The reaction is very strongly acid to medium acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. This horizon ranges from 2 to 4 inches thick.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 4 to 8.

Leon Series

The Leon series consists of nearly level, poorly drained soils that formed in thick beds of sandy marine deposits. These soils are in broad areas on the flatwoods. A high water table is within 12 inches of the surface for 1 to 4 months during most years. It recedes to a depth of more than 40 inches during very dry periods. The slopes range from 0 to 2 percent. These soils are sandy, siliceous, thermic Aeric Haplaquods.

Leon soils are geographically associated with Lynn Haven, Mandarin, Ona, Pottsburg, Sapelo, and Surrency soils. Lynn Haven soils have an umbric epipedon. Mandarin soils are somewhat poorly drained. Ona soils do not have an E horizon. Pottsburg soils have a thicker E horizon than Leon soils. Sapelo soils have an argillic horizon. Surrency soils have an argillic horizon and are very poorly drained.

Typical pedon of Leon fine sand; about 3.3 miles east of Florida State Highway 21, 0.3 mile south of Clay County Road 315 graded; 1,300 feet south and 2,000 feet west of the northeast corner of sec. 13, T. 7 S., R. 24 E.

A—0 to 4 inches; very dark gray (10YR 3/1) fine sand; single grained; loose; many fine and medium roots; many clean sand grains, salt and pepper appearance; extremely acid; clear wavy boundary.

E—4 to 16 inches; light gray (10YR 7/2) fine sand; few black (10YR 2/1) charcoal pebbles; single grained; loose; common medium roots; strongly acid; clear wavy boundary.

Bh1—16 to 20 inches; black (5YR 2/1) fine sand; weak subangular blocky structure; friable; weakly cemented in some parts; few coarse roots; 90 percent or more organic coated sand grains; extremely acid; clear wavy boundary.

Bh2—20 to 26 inches; very dark grayish brown (10YR 3/1) fine sand; weak fine subangular blocky structure; very friable; organic coatings on most

sand grains; extremely acid; clear wavy boundary.

BE—26 to 54 inches; dark brown (10YR 4/3) fine sand; single grained; loose; many uncoated sand grains; strongly acid; clear wavy boundary.

B'h1—54 to 67 inches; dark brown (7.5YR 4/4) fine sand; single grained; loose; many uncoated sand grains; very strongly acid; gradual wavy boundary.

B'h2—67 to 80 inches; black (5YR 2/1) fine sand; single grained; loose; sand grains well coated with organic matter; very strongly acid.

The texture is sand or fine sand to a depth of 80 inches or more. The A horizon is fine sand. The reaction ranges from extremely acid to strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1; or it is neutral and has value of 2 to 4. This horizon is 2 to 8 inches thick.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 2; or it is neutral and has value of 5 to 8. Some pedons have mottles of stronger chroma and vertical black or very dark gray streaks. The thickness of this horizon is 4 to 22 inches.

The Bh horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; hue of 7.5YR, value of 3 or 4, and chroma of 2 or 4; hue of 5YR, value of 2 or 3, and chroma of 1 to 3; or it is neutral and has value of 2. The sand grains are well coated with organic matter. This horizon ranges from 6 to 20 inches in thickness.

The BE horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4. This horizon is 2 to 30 inches thick.

Some pedons have an E' horizon that has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. The thickness of this horizon is 5 to 35 inches.

The B'h horizon is below the E' horizon and has the same color and texture range as the Bh horizon. Some pedons do not have a B'h horizon.

Lynn Haven Series

The Lynn Haven series consists of nearly level, poorly drained soils that formed in sandy deposits. These soils are in low areas on the flatwoods. A high water table is within 12 inches of the surface for 2 to 6 months during most years. It recedes to a depth of more than 40 inches during very dry periods. The slopes range from 0 to 2 percent. These soils are sandy, siliceous, thermic Typic Haplaquods.

Lynn Haven soils are geographically associated with Allanton, Leon, Mandarin, Osier, and Rutlege soils. Allanton soils have a spodic horizon at a depth of more than 50 inches and are very poorly drained. Leon, Mandarin, and Osier soils do not have an umbric epipedon. In addition, Mandarin soils are somewhat poorly drained, and Osier soils do not have a spodic horizon. Rutlege soils do not have a spodic horizon and are very poorly drained.

Typical pedon of Lynn Haven fine sand; about 2.5 miles west of Florida State Highway 225, 3.5 miles north of Florida State Highway 16; 400 feet south and 1,800 feet east of the northwest corner of sec. 20, T. 5 S., R. 23 E.

A1—0 to 12 inches; black (10YR 2/1) fine sand; single grained; loose; many fine and medium roots; very strongly acid; gradual wavy boundary.

A2—12 to 19 inches; very dark gray (10YR 3/1) fine sand; single grained; loose; common fine and medium roots; very strongly acid; clear wavy boundary.

E—19 to 26 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; few fine roots; very strongly acid; abrupt wavy boundary.

Bh1—26 to 48 inches; black (5YR 2/1) fine sand; weak fine granular structure; friable; organic coated sand grains; very strongly acid; gradual wavy boundary.

Bh2—48 to 55 inches; dark brown (10YR 3/3) fine sand; weak fine granular structure, friable; organic coated sand grains; very strongly acid; gradual wavy boundary.

Bh3—55 to 80 inches; black (5YR 2/1) fine sand; weak fine granular structure; loose; organic coated sand grains; very strongly acid.

The texture is fine sand or sand to a depth of 80 inches or more. The surface layer is fine sand. The reaction ranges from extremely acid to strongly acid.

The A or Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1; or it is neutral and has value of 2 or 3. This horizon is 8 to 20 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 2 or less. This horizon is 2 to 18 inches thick.

The Bh horizon has hue of 10YR, value of 2 or 3, and chroma of 2 or 3; hue of 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 2 or 3, and chroma of 1 to 3. The sand grains are well coated with organic matter.

Mandarin Series

The Mandarin series consists of nearly level, somewhat poorly drained, acid soils that formed in thick beds of marine deposits. These soils are in narrow to

broad, slightly convex areas on the flatwoods. A high water table is at a depth of 20 to 40 inches for 2 to 6 months during most years. It may be at a depth of 10 to 20 inches for short periods of about 2 weeks or less during periods of heavy rainfall. The slopes range from 0 to 2 percent. These soils are sandy, siliceous, thermic Typic Haplohumods.

Mandarin soils are geographically associated with Centenary, Hurricane, Leon, and Ortega soils. Centenary and Hurricane soils have a spodic horizon at a depth of more than 50 inches. In addition, Centenary soils are moderately well drained. Leon soils are poorly drained. Ortega soils do not have a spodic horizon, and they are moderately well drained.

Typical pedon of Mandarin fine sand, 0.2 mile east of U.S. Highway 17, 0.2 mile south of Clay County Road 214; NW¼NW¼ sec. 36, T. 7 S., R. 26 E.

A—0 to 5 inches; black (10YR 2/1) fine sand; weak fine crumb structure; very friable; many fine, common medium, few coarse roots; extremely acid; gradual wavy boundary.

E1—5 to 28 inches; light gray (10YR 7/1) fine sand; single grained; loose; common medium roots; few and common distinct (10YR 3/3) streaks; very strongly acid; abrupt wavy boundary.

Bh1—28 to 33 inches; black (5YR 2/1) fine sand; weak medium subangular blocky structure; friable; few medium roots; very strongly acid; clear wavy boundary.

Bh2—33 to 38 inches; dark brown (7.5YR 3/2) fine sand; weak medium subangular blocky structure; friable; few medium roots; few black (5YR 2/1) nodules, 0.25 inch in diameter; very strongly acid; gradual wavy boundary.

BE—38 to 50 inches; dark yellowish brown (10YR 4/4) fine sand; single grained; loose; few medium roots; few dark yellowish brown (10YR 3/4) nodules, 0.25 inch in diameter; very strongly acid; gradual wavy boundary.

E'—50 to 60 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; few fine roots; few medium distinct very dark brown and dark brown root stains; very strongly acid; clear wavy boundary.

B'h—60 to 80 inches; black (5YR 2/1) loamy fine sand; single grained; loose; few fine roots; common medium distinct black (10YR 2/1) streaks; organic coated sand grains; very strongly acid.

The thickness of the solum is more than 35 inches. The reaction ranges from extremely acid to medium acid.

The A horizon has hue of 10YR, value of 2 to 6, and chroma of 1; or it is neutral and has value of 3 to 5. The thickness of this horizon is 2 to 7 inches.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. This horizon is 10 to 24 inches thick. The texture is sand or fine sand.

The Bh horizon has hue of 2.5YR, value of 2 or 3, and chroma of 2 to 4; hue of 5YR, value of 2 or 3, and chroma of 1 to 4; hue of 7.5YR, value of 3, and chroma of 2; or hue of 10YR, value of 2 or 3, and chroma of 1 to 3. This horizon ranges from 8 to 25 inches in thickness. It is weakly cemented in some parts of some pedons. The sand grains are well coated with organic matter. The texture is sand or fine sand.

The BE horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4; hue of 7.5YR, value of 4, and chroma of 2 to 4; or hue of 7.5YR, value of 5, and chroma of 4. This horizon is 0 to 17 inches thick. The texture is sand or fine sand. Some pedons do not have a BE horizon.

The E' horizon has hue of 10YR, value of 5 to 8, and chroma of 1 to 3. The thickness of this horizon is 10 to 24 inches. The texture is sand or fine sand.

The B'h horizon has the same color range as the Bh horizon. It extends to a depth of more than 80 inches. This horizon is weakly cemented in some part of some pedons. The sand grains are coated with organic matter. The texture is sand, fine sand, or loamy fine sand.

Maurepas Series

The Maurepas series consists of very poorly drained organic soils that formed from herbaceous plant material mixed with some woody plant material. These soils are in swamps and wet depressional areas and on the low-lying flood plains of larger streams. During most years, water is at or above the surface for 6 months or more. The slopes are less than 1 percent. These soils are euic, thermic Typic Medisaprists.

Maurepas soils are geographically associated with Osier, Pamlico, Rutlege, Santee, and Surrency soils. Osier, Rutlege, Santee, and Surrency soils are of mineral origin. In addition, Osier soils are poorly drained and are sandy to a depth of 80 inches or more, Rutlege soils are sandy, Santee soils have an argillic horizon at a depth of less than 20 inches, and Surrency soils have an argillic horizon at a depth of 20 to 40 inches. Pamlico soils have sapric material less than 50 inches thick underlain by a sandy material.

Typical pedon of Maurepas muck, frequently flooded; about 200 feet north of William Park Road, 0.9 mile

east of Florida State Highway 209; 900 feet north and 900 feet south of the southwest corner of sec. 8, T. 7 S., R. 27 E.

Oa1—0 to 6 inches; black (10YR 2/1) muck; about 33 percent fiber, unrubbed, and less than 10 percent fiber, rubbed; massive; very friable; many medium roots that crush easily, few coarse roots; very strongly acid; gradual wavy boundary.

Oa2—6 to 34 inches; dark reddish brown (5YR 3/3) muck; about 50 percent fiber, unrubbed, and less than 10 percent fiber, rubbed; massive; very friable; many fine common coarse roots; very strongly acid; gradual wavy boundary.

Oa3—34 to 66 inches; very dark grayish brown (10YR 3/2) muck; about 30 percent fiber, unrubbed, and less than 10 percent fiber, rubbed; massive; nonsticky; many fine roots, less than 10 percent mineral matter; strongly acid; clear wavy boundary.

Cg—66 to 75 inches; gray (10YR 6/1) fine sand; single grained; nonsticky; strongly acid.

The reaction of the Oa horizon ranges from extremely acid to strongly acid in 0.01 molar calcium chloride but is very strongly acid or strongly acid in some part of the control section. The reaction of the mineral horizon is very strongly acid to medium acid.

The surface tier has hue of 5YR to 10YR, value of 2 or 3, and chroma of 2 or less. Fiber content is about 30 to 50 percent, unrubbed, and about 10 percent fiber, rubbed.

The subsurface tier has hue of 5YR to 10YR, value of 2 or 3, and chroma of less than 4. The subsurface tier contains about 50 percent fiber, unrubbed, and less than 15 percent fiber, rubbed.

The bottom tier has the same hue, value, and chroma as the subsurface tier. The fiber content of the bottom tier is about 30 percent, unrubbed, and less than 10 percent fiber, rubbed.

The Cg horizon is sandy or loamy material. This mineral material is at a depth of more than 51 inches and has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Some pedons do not have a Cg horizon.

Meadowbrook Series

The Meadowbrook series consists of nearly level, poorly drained soils that formed in beds of sandy and loamy marine sediment. They are in broad areas on the flatwoods. A high water table is within 12 inches of the surface for 1 to 3 months during most years. The slopes range from 0 to 2 percent. These soils are loamy, siliceous, thermic Grossarenic Ochraqualfs.

Meadowbrook soils are geographically associated with Albany, Leon, Osier, Pelham, Rutlege, Sapelo, and Surrency soils. Albany soils are somewhat poorly drained. Leon and Osier soils are sandy throughout. In addition, Leon soils have a spodic horizon. Pelham soils have an argillic horizon at a depth of 20 to 40 inches. Rutlege soils are sandy to a depth of 80 inches or more and are very poorly drained. Sapelo soils have a spodic horizon. Surrency soils have an argillic horizon at a depth of 20 to 40 inches and are very poorly drained.

Typical pedon of Meadowbrook sand; 0.5 mile east of U.S. Highway 301, 0.9 mile south of Duval County line; 1,100 feet east and 600 feet north of the southwest corner of sec. 4, T. 4 S., R. 23 E.

A—0 to 7 inches; very dark gray (10YR 3/1) sand; weak fine granular structure; very friable; many fine, few medium and coarse roots; extremely acid; gradual wavy boundary.

Eg1—7 to 35 inches; gray (10YR 5/1) sand; common medium distinct very dark gray (10YR 3/1) mottles; single grained; loose; strongly acid; gradual wavy boundary.

Eg2—35 to 42 inches; gray (10YR 6/1) sand; common medium faint grayish brown (10YR 5/2) mottles and few distinct yellow (10YR 7/6) mottles; single grained; loose; medium acid; clear wavy boundary.

Btg1—42 to 70 inches; gray (10YR 6/1) sandy loam; common coarse prominent and few medium prominent reddish yellow (7.5YR 6/8) mottles; weak medium granular structure; friable; few 0.25 to 1 inch ironstone concretions; medium acid; gradual wavy boundary.

Btg2—70 to 80 inches; light gray (10YR 7/1) sandy loam; few fine prominent brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; strongly acid.

The thickness of the solum is 50 to more than 80 inches. The reaction ranges from extremely acid to neutral in the surface layer and from strongly acid to moderately alkaline in the other layers.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. This horizon is 4 to 10 inches thick. If value is 3 or less, the thickness is 7 inches or less. The texture is sand or fine sand.

The Eg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Mottles are in shades of gray, yellow, and brown. The texture is sand or fine sand. This horizon is 31 to 70 inches thick.

The Btg horizon has hue of 10YR, value of 5 to 7,

and chroma of 1; or it is neutral and has value of 5 to 7. Mottles are in various shades of gray, yellow, brown, and red. The texture is sandy loam, fine sandy loam, or sandy clay loam. Some pedons have a thin loamy sand or loamy fine sand layer in the upper part of the pedon.

Meggett Series

The Meggett series consists of nearly level, poorly drained soils that formed in clayey marine sediment. These soils are in broad, low-lying areas on the flatwoods. A high water table is at a depth of less than 12 inches for 2 to 5 months during most years. The slopes range from 0 to 2 percent. These soils are fine, mixed, thermic Typic Albaqualfs.

Meggett soils are geographically associated with Goldhead, Pelham, and Surrency soils. All of the associated soils have a loamy argillic horizon at a depth of 20 to 40 inches, and they do not have an abrupt texture change between the E and Bt horizons. In addition, Pelham and Surrency soils have low base saturation, and Surrency soils are very poorly drained

Typical pedon of Meggett fine sandy loam; 2.3 miles east of Brannenfield Road, 1¾ miles south of Duval County line; 1,320 feet north and 1,200 feet east of the southwest corner of sec. 10, T. 4 S., R. 25 E.

A—0 to 6 inches; very dark brown (10YR 2/2) fine sandy loam; weak fine granular structure; very friable; many fine, few medium roots; very strongly acid; clear wavy boundary.

Eg—6 to 11 inches; grayish brown (10YR 5/2) fine sandy loam; common medium distinct yellowish brown (10YR 5/6) or (10YR 5/8) mottles; weak fine granular structure; very friable; strongly acid; clear wavy boundary.

Btg1—11 to 23 inches; gray (10YR 5/1) clay loam; common medium distinct brownish yellow (10YR 6/6) mottles and many medium prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; strongly acid; gradual wavy boundary.

Btg2—23 to 46 inches; gray (5Y 5/1) sandy clay; common medium distinct red (2.5YR 4/6) mottles and brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; very firm; clay skins on ped faces; few small streaks of sand; few coarse roots; strongly acid; gradual wavy boundary.

Btg3—46 to 80 inches; light olive gray (5Y 6/2) clay; common medium distinct brownish yellow (10YR 6/6) mottles and greenish gray (5G 6/1) mottles; weak medium subangular blocky structure; very firm; clay skins on ped faces; medium acid.

The thickness of the solum ranges from 40 to 80 inches or more. The reaction is very strongly acid to slightly acid in the A and E horizons, strongly acid to moderately alkaline in the upper part of the B horizon, and medium acid to moderately alkaline in the lower part of the B horizon.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. This horizon is 3 to 6 inches thick.

The Eg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. The texture is loamy sand or fine sandy loam. This horizon ranges from 0 to 7 inches in thickness. Some pedons do not have an Eg horizon. Between the A and Btg horizon is an abrupt texture change.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. This horizon has few to many mottles in shades of gray, yellow, brown, and red. The texture is sandy clay or clay. The upper part of the Btg horizon includes clay loam. This horizon is 32 to 65 inches thick. Fine concretions of soft and hard calcium carbonate range from none to many. Some pedons have a BCg horizon that has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2; or hue of 5GY, value of 5 or 6, and chroma of 1. The texture is sandy clay or sandy clay loam. Fine concretions of calcium carbonate or shell fragments range from none to common.

Neilhurst Series

The Neilhurst series consists of gently sloping, excessively drained soils that are dominantly sandy spoil material from mining operations. These soils are in broad areas on the gentle rolling uplands and on slight knolls on the flatwoods. The water table is at a depth of more than 72 inches during most years. The slopes dominantly range from 2 to 5 percent but range from 1 to 12 percent in the more steep areas on the short side slopes. These soils are hyperthermic, uncoated Typic Quartzipsamments.

Neilhurst soils are geographically associated with Blanton, Centenary, Hurricane, Leon, Mandarin, Ortega, and Ridgewood soils. Blanton soils are moderately well drained and have an argillic horizon at a depth of 40 to 80 inches. Centenary and Ortega soils are moderately well drained. Hurricane, Mandarin, and Ridgewood soils are somewhat poorly drained. Leon soils are poorly drained.

Typical pedon of Neilhurst fine sand, undulating; 2.7 miles north of Clay County Road 225, 0.8 mile east of Bradford County line; 1,000 feet south and 1,500 feet

west of northeast corner of sec. 30, T. 5 S., R. 23 E.

A—0 to 3 inches; gray (10YR 6/1) fine sand; single grained; loose; strongly acid; abrupt wavy boundary.

C—3 to 80 inches; reddish brown (5YR 4/3) fine sand; single grained; loose; common medium distinct dark reddish brown, reddish brown, and dark reddish gray streaks and splotches of organic matter and iron stains; strongly acid.

The texture is sand or fine sand to a depth of 80 inches or more. The reaction is very strongly acid to moderately acid. The content of silt plus clay in the 10- to 40-inch control section is less than 5 percent.

The A horizon has hue of 10YR to 5YR, value of 5 to 7, and chroma of 1 or 2. Thin dark streaks are in the surface layer of some pedons.

The C horizon has hue of 5YR to 10YR, value of 3 to 8, and chroma of 1 to 3. Many pedons have black or dark reddish brown splotches. These dark colors are organic matter and iron stains from spodic horizons destroyed in the mining process.

Newnan Series

The Newnan series consists of nearly level, somewhat poorly drained soils that formed in thick marine deposits. These soils are in slightly convex areas on the broad flatwoods and along the lower slopes of the gently sloping uplands. A high water table is at a depth of 18 to 30 inches for 1 to 2 months and at a depth of 30 to 60 inches for 2 to 5 months during most years. The slopes range from 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Ultic Haplohumods.

Newnan soils are geographically associated with Albany, Blanton, Centenary, Hurricane, Leon, Mandarin, Ortega, Penney, Pottsburg, Ridgewood, and Sapelo soils. Albany and Blanton soils do not have a spodic horizon. In addition, Blanton soils are moderately well drained. Centenary and Hurricane soils have a spodic horizon that is deeper in the profile than in Newnan soils and do not have an argillic horizon. In addition, Centenary soils are moderately well drained. Leon and Pottsburg soils do not have an argillic horizon and are poorly drained. Mandarin soils do not have an argillic horizon. Ortega, Penney, and Ridgewood soils do not have a spodic horizon or an argillic horizon. In addition, Penney soils are excessively drained, and Ortega soils are moderately well drained. Sapelo soils are poorly drained.

Typical pedon of Newnan fine sand; approximately 600 feet west of Trail Road, 2.3 miles south of Duval County line; 1,700 feet south and 2,200 feet west of the northeast corner of sec. 18, T. 4 S., R. 24 E.

A—0 to 5 inches; black (10YR 2/1) fine sand; single grained; loose; many clean sand grains, many fine and medium and coarse roots; extremely acid; clear wavy boundary.

E1—5 to 11 inches; gray (10YR 5/1) fine sand; single grained; loose; few charcoal pebbles; few fine and medium and coarse roots; extremely acid; gradual wavy boundary.

E2—11 to 19 inches; light gray (10YR 7/1) fine sand; single grained; loose; few charcoal pebbles; few fine and medium roots; extremely acid; clear wavy boundary.

Bh1—19 to 23 inches; dark reddish brown (5YR 2/2) fine sand; weak medium subangular blocky structure; friable; many fine roots; organic coated sand grains; extremely acid; gradual wavy boundary.

Bh2—23 to 29 inches; dark brown (7.5YR 3/2) fine sand; weak medium subangular blocky structure; very friable; few medium distinct dark reddish brown (5YR 2/2) mottles; many fine roots; extremely acid; clear wavy boundary.

E'1—29 to 40 inches; brown (10YR 5/3) fine sand; streak of dark yellowish brown (10YR 3/4) root stains; weak medium granular structure; very friable; many fine roots; extremely acid; gradual wavy boundary.

E'2—40 to 51 inches; light gray (10YR 7/1) fine sand; single grained; loose; extremely acid; clear wavy boundary.

Btg—51 to 80 inches; light gray (10YR 7/2) sandy clay loam; common medium distinct yellowish brown (10YR 5/6 and 5/8) mottles; weak medium subangular blocky structure; friable; few root hairs; extremely acid.

The thickness of the solum is 60 inches or more. The reaction is extremely acid to medium acid. Depth to the spodic horizon ranges from 10 to 30 inches, and depth to the argillic horizon ranges from 40 to 79 inches.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2; or it is neutral and has value of 3 to 4. This horizon is 4 to 8 inches thick. If value is 3, the thickness is 4 or 5 inches.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. In some pedons, this horizon has a few mottles in shades of yellow or brown. The thickness of this horizon is 6 to 22 inches.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. The texture is sand or fine sand. The sand grains are well coated with organic matter. This horizon ranges from 4 to 12 inches in thickness.

Some pedons have a BE horizon that has hue of 10YR, value of 4 or 5, and chroma of 3 or 4; or hue of 7.5YR, value of 4, and chroma of 2 or 4. In some pedons, this horizon has brown or gray mottles. The texture is generally fine sand, but it may range from fine sand to sand. The BE horizon is 0 to 6 inches thick.

The E' horizon has hue of 10YR, value of 6 to 8, and chroma of 1 to 4; or hue of 10YR, value of 5, and chroma of 2 or 3 and may have mottles in shades of gray, yellow, and brown. This horizon is 18 to 44 inches thick. The texture is sand or fine sand.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3. The texture is sandy loam, fine sandy loam, or sandy clay loam.

Ocilla Series

The Ocilla series consists of nearly level to gently sloping, somewhat poorly drained soils that formed in thick beds of loamy marine deposits. These soils are in slightly convex areas on the flatwoods and along the fringe areas between the flatwoods and the uplands. The water table is at a depth of 12 to 30 inches for about 2 to 6 months during most years. During most of the remainder of the year, it is at a depth of more than 30 inches. The slopes range from 0 to 5 percent. These soils are loamy, siliceous, thermic Aquic Arenic Paleudults.

Ocilla soils are geographically associated with Albany, Blanton, Pelham, and Plummer soils. Albany and Blanton soils have an argillic horizon between depths of 40 and 80 inches. In addition, Blanton soils are moderately well drained. Pelham soils are poorly drained. Plummer soils have an argillic horizon at a depth of 40 and 80 inches and are poorly drained.

Typical pedon of Ocilla loamy fine sand, 0 to 5 percent slopes; about 0.3 mile south of Florida State Highway 218, 5 miles east of U.S. Highway 301; 1,000 feet south and 2,400 feet west of the northeast corner of sec. 35, T. 4 S., R. 24 E.

A—0 to 6 inches; very dark grayish brown (10YR 3/2) loamy fine sand; weak fine granular structure; friable; many fine and medium roots; few to many clean sand grains; medium acid; clear wavy boundary.

E1—6 to 11 inches; yellowish brown (10YR 5/4) loamy fine sand; weak fine granular structure; very friable; common very dark grayish brown (10YR 3/2) streaks; strongly acid; gradual wavy boundary.

E2—11 to 27 inches; very pale brown (10YR 7/4) loamy fine sand; few common distinct brownish yellow (10YR 6/8) mottles; medium fine granular structure; friable; few fine roots; few common distinct dark gray splotches; strongly acid; clear wavy boundary.

Bt1—27 to 45 inches; brownish yellow (10YR 6/8) fine sandy loam; many coarse prominent red (2.5YR 4/8) and strong brown (7.5YR 5/8) mottles and common medium distinct gray (10YR 7/2) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

Bt2—45 to 73 inches; gray (10YR 7/2) clay loam; many coarse prominent red (2.5YR 5/6) mottles and common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

Bt3—73 to 80 inches; mottled light gray (10YR 7/2), red (2.5YR 4/8), and brownish yellow (10YR 6/8) fine sandy loam; weak medium subangular blocky structure; friable; very strongly acid.

The solum is 72 inches or more thick. The reaction is very strongly acid to strongly acid except where lime has been added. The solum contains less than 3 percent plinthite, by volume.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2; or it is neutral and has value of 3 or 4. This horizon is 4 to 6 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4; hue of 2.5Y, value of 6, and chroma of 2 to 4; or hue of 2.5Y, value of 7 or 8, and chroma of 4. This horizon is 16 to 34 inches thick. The E2 horizon contains few to common mottles in shades of gray, yellow, and brown.

The Bt1 horizon has hue of 10YR, value of 5 to 7, and chroma of 4 to 8; or hue of 2.5Y, value of 6, and chroma of 4 to 8. This horizon has mottles in various shades of gray, yellow, red, and brown. It is 9 to 18 inches thick. The Bt2 horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 3. This horizon has mottles in various shades of gray, yellow, brown, or red, or it is a mixture of these colors. It is 9 to 18 inches thick. The Bt3 horizon is mottled in shades of gray, red, and yellow. The texture of the B horizon is fine sandy loam, clay loam, sandy loam, or sandy clay loam. Some pedons have a BE horizon that has the same color

range as the Bt1 horizon. This horizon is 6 to 10 inches thick. The texture is loamy sand, loamy fine sand, or sandy loam.

Ona Series

The Ona series consists of nearly level, poorly drained soils that formed in beds of sandy marine deposits. They are in broad areas on the flatwoods. A high water table is within 12 inches of the surface for 2 to 4 months during most years. The slopes range from 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Typic Haplaquods.

Ona soils are geographically associated with Allanton, Leon, Lynn Haven, Osier, Pottsburg, and Rutlege soils. Allanton and Lynn Haven soils have a thick, dark surface layer. In addition, Allanton soils are very poorly drained. Leon and Pottsburg soils have an E horizon. Osier and Rutlege soils do not have a spodic horizon. In addition, Rutlege soils are very poorly drained.

Typical pedon of Ona fine sand; 5.9 miles west of of U.S. Highway 17, 0.2 mile north of Clay County Road 214 graded; 1,400 feet north and 400 east of southwest corner of sec. 36, T. 7 S., R. 25 E.

A—0 to 5 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; gradual wavy boundary.

Bh—5 to 15 inches; dark brown (7.5YR 3/2) fine sand; weak fine granular structure; friable; many fine and medium roots; organic coated sand grains; very strongly acid; gradual wavy boundary.

E1—15 to 30 inches; dark gray (10YR 4/1) fine sand; single grained; loose; many fine roots; very strongly acid; gradual wavy boundary.

E2—30 to 41 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; few fine roots; very strongly acid; clear wavy boundary.

B'h—41 to 60 inches; very dark brown (10YR 2/2) fine sand; few medium distinct grayish brown mottles; weak fine granular structure; organic coated sand grains; very strongly acid; gradual wavy boundary.

BC—60 to 80 inches; dark brown (10YR 4/3) fine sand; single grained; organic coated sand grains; very strongly acid.

The texture of the soil is fine sand or sand to a depth of 80 inches or more. The reaction ranges from extremely acid to medium acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 3. Some pedons have an incipient E horizon that is 1 to 2 inches thick between the A horizon and the Bh horizon. The thickness of the A horizon is 4 to 9 inches.

The Bh horizon has hue of 10YR, value of 2, and chroma of 1 or 2; hue of 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 2 or 3, and chroma of 2 or less. The thickness of the Bh horizon is 8 to 32 inches.

The E horizon has hue of 10YR, value of 4 to 8, and chroma of 1 or 2. The thickness of the E horizon is 11 to 41 inches.

The B'h horizon has the same colors as the Bh horizon. Depth to the B'h horizon is more than 30 inches.

The BC horizon has hue of 5YR, value of 4, and chroma of 4; or hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Some pedons do not have a BC horizon.

In pedons that do not have an E horizon and a B'h horizon, the C horizon will have hue of 10YR, value of 5 to 8, and chroma of 1 to 4; or hue of 2.5Y, value of 6 to 8, and chroma of 2.

Ortega Series

The Ortega series consists of nearly level to moderately sloping, moderately well drained soils that formed in thick beds of sandy marine deposits. These soils are on low ridges on the flatwoods and in broad transitional areas between the uplands and the flatwoods. A high water table is between depths of 40 and 60 inches for cumulative periods of 6 to 8 months during most years. It is at a depth of more than 60 inches during droughty periods. The slopes range from 0 to 8 percent. These soils are thermic, uncoated Typic Quartzipsamments.

Ortega soils are geographically associated with Albany, Blanton, Centenary, Hurricane, Penney, and Ridgewood soils. Albany and Blanton soils have an argillic horizon at a depth of 40 to 80 inches. In addition, Albany soils are somewhat poorly drained. Centenary soils have a spodic horizon at a depth of 50 to 80 inches. Hurricane soils have a spodic horizon and are somewhat poorly drained. Penney soils are excessively drained. Ridgewood soils are somewhat poorly drained.

Typical pedon of Ortega fine sand, 0 to 5 percent slopes; 0.5 mile west of Rosemary Hill Road, 0.9 mile north of Florida State Highway 16; 500 feet south and 1,300 feet east of northwest corner of sec. 7, T. 6 S., R. 26 E.

A—0 to 3 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; many fine, few medium and coarse roots; many clean white (10YR 8/1) sand grains; extremely acid; gradual wavy boundary.

C1—3 to 18 inches; very pale brown (10YR 7/4) fine sand; single grained; loose; common medium roots; many clean white (10YR 8/1) sand grains; few black (10YR 2/1) charcoal fragments; slightly acid; gradual wavy boundary.

C2—18 to 48 inches; yellow (10YR 7/6) fine sand; single grained; loose; few coarse roots; many clean white (10YR 8/1) sand grains; common very pale brown (10YR 7/3) sand streaks; few black (10YR 2/1) charcoal fragments; strongly acid; gradual wavy boundary.

C3—48 to 62 inches; yellow (10YR 7/6) fine sand; common medium distinct strong brown (7.5YR 5/8) mottles, and white (10YR 8/2) common medium faint brownish yellow (10YR 6/8) mottles; single grained; loose; very strongly acid; clear wavy boundary.

C4—62 to 80 inches; white (10YR 8/2) fine sand; single grained; loose; very strongly acid.

The texture of the soil is fine sand or sand to a depth of 80 inches or more. The surface layer is fine sand. This soil contains less than 5 percent silt plus clay within 10 to 40 inches of the surface. The reaction ranges from extremely acid to slightly acid except where lime has been added.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. This horizon is 3 to 6 inches thick.

The C1 and C2 horizons have hue of 10YR, value of 5 to 7, and chroma of 3 to 8. The C3 horizon has hue of 10YR, value of 5 to 7, and chroma of 6 to 8; or hue of 10YR, value of 7 or 8, and chroma of 1 or 2. The C4 horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2. The C3 and C4 horizons in some pedons have few to common mottles in shades of gray, yellow, brown, and red. The thickness of the C horizon is more than 78 inches. Few or common, light gray or white streaks and splotches of clean sand grains are in the C1, C2, and C3 horizons in some pedons. These light gray or white streaks are not indicative of wetness.

Osier Series

The Osier series consists of nearly level, poorly drained soils that formed in sandy marine sediment. These soils are on broad flatwoods and in depressions in the deep, sandy areas on the gently rolling uplands. A high water table is at a depth of less than 12 inches for 3 to 6 months during most years. The slopes range from 0 to 2 percent. These soils are siliceous, thermic Typic Psammaquents.

Osier soils are geographically associated with Albany, Hurricane, Leon, Plummer, Ridgewood, and Rutlege soils. Albany soils have an argillic horizon between depths of 40 and 80 inches and are somewhat poorly drained. Hurricane soils have a spodic horizon between depths of 50 and 80 inches and are somewhat poorly drained. Leon soils have a spodic horizon at a depth of less than 30 inches. Plummer soils have an argillic horizon at a depth of more than 40 inches. Ridgewood soils are somewhat poorly drained. Rutlege soils have an umbric epipedon and are very poorly drained.

Typical pedon of Osier fine sand; about 1.1 miles south-southeast of junction of Florida State Highway 226 and Florida State Highway 209, 250 feet west of Florida State Highway 209, 600 feet north and 2,600 feet west of the southeast corner of Land Grant sec. 38, T. 6 S., R. 26 E.

A—0 to 5 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; many fine and common roots; very strongly acid; clear wavy boundary.

Cg1—5 to 16 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; common fine roots; very strongly acid; gradual wavy boundary.

Cg2—16 to 33 inches; grayish brown (10YR 5/2) fine sand; few fine distinct mottles of yellowish brown (10YR 5/4); single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

Cg3—33 to 48 inches; light brownish gray (10YR 6/2) fine sand; common medium distinct brownish yellow (10YR 6/8) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

Cg4—48 to 62 inches; gray (10YR 6/1) fine sand; common medium distinct strong brown (7.5YR 5/6) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

Cg5—62 to 80 inches; dark grayish brown (10YR 4/2) fine sand; few distinct gray (10YR 6/1) mottles; single grained; loose; very strongly acid.

The texture of this soil is fine sand or sand to a depth of 80 inches or more. Between depths of 10 and 40 inches, the silt plus clay content is 5 to 10 percent. The reaction ranges from extremely acid to medium acid.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2; or hue of 2.5Y, value of 5, and

chroma of 2. The horizon is 3 to 7 inches thick.

The Cg horizon has hue of 10YR, value of 4 to 8, and chroma of 1 or 2; or it is neutral and has value of 4 to 8.

Ousley Series

The Ousley series consists of nearly level, somewhat poorly drained, sandy soils that formed in thick beds of sandy marine deposits. These soils are on low terraces and flood plains. A high water table is at a depth of 18 to 36 inches for 2 to 4 months during most years. The slopes range from 0 to 2 percent. These soils are thermic, uncoated Aquic Quartzipsamments.

Ousley soils are geographically associated with Albany, Hurricane, Meadowbrook, Ortega, and Osier soils. Albany soils have an argillic horizon at a depth of 40 to 80 inches. Hurricane soils have a spodic horizon. Meadowbrook soils have an argillic horizon at a depth of 40 to 80 inches and are poorly drained. Ortega soils are moderately well drained. Osier soils are poorly drained.

Typical pedon of Ousley fine sand, occasionally flooded; about 2 miles northwest of Middleburg; 1,000 feet north and 500 feet east of the southwest corner of sec. 3, T. 5 S., R. 24 E.

A—0 to 5 inches; dark gray (10YR 4/1) fine sand; single grained; loose; many fine and medium roots; very strongly acid; clear wavy boundary.

A2—5 to 12 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; many fine and medium roots; very strongly acid; gradual wavy boundary.

C1—12 to 22 inches; very pale brown (10YR 7/4) fine sand; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

C2—22 to 39 inches; light yellowish brown (10YR 6/4) fine sand; common medium distinct reddish yellow (7.5YR 6/6) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

C3—39 to 61 inches; light brownish gray (10YR 6/2) fine sand; common medium distinct reddish yellow mottles; single grained; loose; very strongly acid; gradual wavy boundary.

C4—61 to 80 inches; brown (10YR 5/3) fine sand; few fine faint very pale brown mottles; single grained; loose; very strongly acid.

The texture is fine sand or sand to a depth of 80 inches or more. The surface layer is fine sand. Between depths of 10 and 40 inches, the silt plus clay content is 2 to 5 percent. The reaction is very strongly acid or strongly acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2, or it is neutral and has value of 3 to 5. This horizon is 4 to 12 inches thick.

The upper part of the C horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. The lower part has hue of 10YR, value of 5 to 7, and chroma of 2 to 4. Mottles indicative of wetness are within 40 inches of the surface where the water table fluctuates.

Pamlico Series

The Pamlico soils consists of nearly level, very poorly drained organic soils that formed mostly from nonwoody, hydrophytic plant remains mixed with some woody plant material. These soils are in large and small swamps. The high water table is at or near the surface except during extended dry periods. The slopes range from 0 to 1 percent. These soils are sandy or sandy-skeletal, siliceous, dysic, thermic Terric Medisaprists.

Pamlico soils are geographically associated with Leon, Maurepas, Osier, Rutlege, and Surrency soils. All of the associated soils are of mineral origin except Maurepas soils. In addition, Leon soils are poorly drained and have a spodic horizon within 30 inches of the surface. Maurepas soils have more than 51 inches of sapric material. Osier soils are poorly drained and are sandy to a depth of 80 inches or more. Rutlege soils have an umbric epipedon. Surrency soils have an argillic horizon at a depth of 20 to 40 inches.

Typical pedon of Pamlico muck; approximately 0.5 mile west of U.S. Highway 17, 0.25 mile north of Beary Bay Road; 500 feet north and 2,800 feet west of the southeast corner of sec. 26, T. 7 S., R. 26 E.

Oa1—0 to 16 inches; dark brown (7.5YR 3/2) muck; about 30 percent fiber, unrubbed, and 10 percent fiber, rubbed; massive; very friable; fibers of leaves, twigs, and roots; light yellowish brown (10YR 6/4) sodium pyrophosphate; very strongly acid; gradual wavy boundary.

Oa2—16 to 38 inches; very dark gray (10YR 3/1) muck; less than 5 percent fibers, rubbed; massive; friable; dark yellowish brown (10YR 4/4) sodium pyrophosphate; very strongly acid; clear wavy boundary.

Cg—38 to 75 inches; grayish brown, (10YR 5/2) fine sand; single grained loose; very strongly acid.

The reaction of the organic material is extremely acid

or very strongly acid in 0.01 molar calcium chloride. The reaction of the mineral material ranges from extremely acid to strongly acid.

The Oa horizon has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. The fiber content, unrubbed, is 30 percent or less and is less than 10 percent, rubbed. Sodium pyrophosphate extract has hue of 10YR, value of 3 to 6, and chroma of 3 to 6. The organic material is 16 to 51 inches thick.

The Cg horizon has hue of 10YR, value of 3 to 6, and chroma of 1 or 2; or it is neutral and has value of 3 to 6. The texture is sand or fine sand.

Pelham Series

The Pelham series consists of nearly level, poorly drained soils that formed in thick beds of loamy marine sediment. They are in broad areas on the flatwoods. A high water table is at a depth of less than 12 inches for 1 to 4 months during most years. During dry periods, it recedes to a depth of more than 40 inches. The slopes range from 0 to 2 percent. These soils are loamy, siliceous, thermic Arenic Paleaquults.

Pelham soils are geographically associated with Albany, Meadowbrook, Meggett, Ocilla, and Surrency soils. Albany and Meadowbrook soils have an argillic horizon at a depth of 40 to 80 inches. In addition, Albany soils are somewhat poorly drained. Meggett soils have a clayey argillic horizon within 20 inches of the surface. Ocilla soils are somewhat poorly drained. Surrency soils have an umbric epipedon and are very poorly drained.

Typical pedon of Pelham fine sand; about 2.3 miles west of Clay County Road 224, 300 feet south of Florida State Highway 21; 500 feet south and 400 feet east of the northwest corner of sec. 33, T. 4 S., R. 25 E.

Ap—0 to 4 inches; very dark grayish brown (10YR 3/2) fine sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; gradual wavy boundary.

Eg1—4 to 20 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; common medium distinct grayish brown and brown splotches; common, medium and fine roots; strongly acid; gradual wavy boundary.

Eg2—20 to 26 inches; light gray (10YR 7/1) fine sand; single grained; loose; few fine distinct light yellowish brown sand streaks; few fine and medium roots; very strongly acid; abrupt wavy boundary.

Btg1—26 to 64 inches; light gray (10YR 7/1) and yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; gray (10YR 5/1) splotches of fine sand; few fine distinct red streaks 1½ to 2½ inches in diameter; few medium roots; extremely acid; gradual wavy boundary.

Btg2—64 to 80 inches; light gray (10YR 7/1) very fine sandy loam; moderate medium subangular blocky structure; friable; common medium distinct yellowish brown (10YR 5/6) and brownish yellow (10YR 6/8) streaks; few pockets of fine sand 1½ to 2 inches in diameter; extremely acid.

The thickness of the solum is 60 inches or more. The reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR to 5Y, value of 2 to 4, and chroma of 1 or 2; or it is neutral and has value of 2 to 4. The thickness of the A horizon is 4 to 8 inches. If the A horizon is black or very dark gray, it is only 4 to 6 inches thick.

The Eg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. In places, this horizon is mottled in shades of brown, gray, or yellow. The texture is sand or fine sand. The thickness of this horizon is 18 to 32 inches.

Some pedons have a BE horizon that has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. The texture is loamy sand, loamy fine sand, or sandy loam. This horizon is 4 to 10 inches thick.

The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 2 or less. The texture of the Btg1 and Btg2 horizons is sandy loam, fine sandy loam, very fine sandy loam, or sandy clay loam. The texture of the Btg3 is sandy clay loam or sandy clay. The Btg horizon is 40 to more than 60 inches thick.

Penney Series

The Penney series consists of nearly level to moderately sloping, excessively drained soils that formed in thick beds of sandy marine deposits. These soils are on some landscapes that are quite variable, changing from nearly smooth or slightly convex areas to highly convex and concave areas within short distances. The water table is at a depth of more than 72 inches. The slopes range from 0 to 8 percent. These soils are thermic, uncoated Typic Quartzipsamments.

Penney soils are geographically associated with Albany, Blanton, Centenary, and Ortega soils. Albany and Blanton soils have an argillic horizon at a depth of 40 to 80 inches. In addition, Albany soils are somewhat

poorly drained, and Blanton soils are moderately well drained. Centenary and Ortega soils are moderately well drained. In addition, Centenary soils have a spodic horizon at a depth of more than 50 inches.

Typical pedon of Penney fine sand, 0 to 5 percent slopes; 1.5 mile north of Florida State Highway 16, 800 feet west of dirt road; 1,600 feet north and 1,600 feet east of the southwest corner of NW¼SW¼ sec. 6, T. 6 S., R. 26 E.

A—0 to 3 inches; gray (10YR 5/1) fine sand; single grained; loose; few fine and medium roots; many uncoated sand grains; extremely acid; clear smooth boundary.

E1—3 to 17 inches; brownish yellow (10YR 6/6) fine sand; single grained; loose; few fine roots; common black (10YR 2/1) charcoal fragments; very strongly acid; gradual wavy boundary.

E2—17 to 45 inches; yellow (10YR 7/6) fine sand; single grained; loose; few fine and large roots; many uncoated sand grains; few black (10YR 2/1) charcoal fragments; very strongly acid; gradual wavy boundary.

E3—45 to 57 inches; very pale brown (10YR 7/4) fine sand; single grained; loose; few medium roots; many uncoated sand grains; very strongly acid; gradual wavy boundary.

E&B—57 to 80 inches; very pale brown (10YR 7/4) fine sand (E); single grained; loose; many uncoated sand grains; yellowish brown (10YR 5/6) loamy fine sand lamellae (B) about 3 to 8 inches long and ⅛ to ¼ inches thick; well coated sand grains; strongly acid.

The thickness of the solum is 80 inches or more. The content of silt plus clay is less than 5 percent between depths of 10 to 40 inches. The reaction is extremely acid to medium acid.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. This horizon ranges from 3 to 7 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 8, and and chroma of 3 to 8. Few or common fine and medium streaks in hue of 10YR, value of 7 or 8, and chroma of 1 or 2 generally are in this horizon, but the color is that of the uncoated sand grains and is not indicative of wetness. The thickness of this horizon is 47 to 72 inches.

The E part of the E&B horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 8. The texture of this part of the horizon is sand or fine sand, and it is 2 to 8 inches thick between the lamellae. The B part of this horizon is lamellae that has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. The texture of this lamellae is loamy sand, loamy fine sand, or sandy loam. It ranges from 1/32 to ¼ inch in thickness and ½ inch to 24 inches in length. These lamellae are in the soil at a depth of 50 to 80 inches and extend to a depth of more than 80 inches, generally increasing in thickness with depth. Few or common small pockets of light gray or white clean sand grains are in the E part of this horizon in some pedons.

Plummer Series

The Plummer series consists of nearly level, poorly drained and very poorly drained soils that formed in thick beds of sandy and loamy marine sediment. These soils are in the broad areas on the flatwoods and in depressions. A high water table is within 12 inches of the surface for 1 to 4 months during most years. Depressional areas are ponded for 4 months or more. The slopes are 0 to 2 percent. These soils are loamy, siliceous, thermic Grossarenic Paleaquults.

Plummer soils are geographically associated with Albany, Leon, Osier, Pelham, Rutlege, Sapelo, and Surrency soils. Albany soils are somewhat poorly drained. Leon and Osier soils are sandy throughout. In addition, Leon soils have a spodic horizon. Pelham soils have an argillic horizon at a depth of 20 to 40 inches. Rutlege soils are sandy to a depth of 80 inches or more and are very poorly drained. Sapelo soils have a spodic horizon. Surrency soils have an argillic horizon at a depth of 20 to 40 inches and are very poorly drained.

Typical pedon of Plummer fine sand; 2.5 miles south of Florida State Highway 226, 2.2 miles west of Florida State Highway 209; 700 feet south and 700 feet west of northeast corner of sec. 2, T. 7 S., R. 26 E.

A—0 to 7 inches; very dark grayish brown (10YR 3/2) fine sand; weak medium granular structure; very friable; many fine roots; very strongly acid; clear wavy boundary.

Eg1—7 to 24 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; common fine roots; very strongly acid; gradual wavy boundary.

Eg2—24 to 52 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; few fine roots; very strongly acid; clear wavy boundary.

Btg1—52 to 67 inches; gray (10YR 5/1) sandy clay loam; few medium distinct yellowish brown (10YR 5/6) mottles and few medium prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; few fine roots;

very strongly acid; gradual wavy boundary.

Btg2—67 to 80 inches; gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; very strongly acid.

The thickness of the solum is 80 inches or more. The reaction ranges from extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 3 to 4, and chroma of 1 or 2. This horizon is 4 to 10 inches thick. If color value is 3, the thickness is 7 inches or less.

The Eg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Some pedons have mottles in shades of gray, yellow, and brown. The texture is sand or fine sand. This horizon is 40 to 80 inches thick.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1; or it is neutral and has value of 5 to 7. Mottles are in various shades of gray, yellow, brown, and red. The texture is sandy loam or sandy clay loam.

Pottsburg Series

The Pottsburg series consists of nearly level, poorly drained soils that formed in thick beds of sandy marine deposits. These soils are in broad areas on the flatwoods. A high water table is within 12 inches of the surface for 1 to 4 months during most years. The slopes range from 0 to 2 percent. These soils are sandy, siliceous, thermic Grossarenic Haplaquods.

Pottsburg soils are geographically associated with Hurricane, Leon, Lynn Haven, Mandarin, Osier, Plummer, Ridgewood, and Rutlege soils. Hurricane soils are somewhat poorly drained. Leon soils have a spodic horizon at a depth of less than 30 inches. Lynn Haven soils have an umbric epipedon and a spodic horizon at a depth of less than 30 inches. Mandarin soils have a spodic horizon at a depth of less than 30 inches and are somewhat poorly drained. Osier soils do not have a spodic horizon. Plummer soils have an argillic horizon and do not have a spodic horizon. Ridgewood soils are somewhat poorly drained. Rutlege soils have an umbric epipedon, do not have a spodic horizon, and are very poorly drained.

Typical pedon of Pottsburg fine sand; about 3.1 miles east of Florida State Highway 21, 0.3 mile south of Clay County Road 315; 1,300 feet south and 1,500 feet east of the northwest corner of sec. 13, T. 7 S., R. 24 E.

A—0 to 7 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; many fine and common fine roots; extremely acid; gradual wavy boundary.

E1—7 to 28 inches; gray (10YR 6/1) fine sand; common medium distinct dark gray streaks; single grained; loose; medium acid; gradual wavy boundary.

E2—28 to 53 inches; grayish brown (10YR 5/2) fine sand; few medium distinct dark gray mottles; single grained; loose; medium acid; gradual wavy boundary.

Bh1—53 to 63 inches; very dark gray (5YR 3/1) fine sand; weak fine subangular blocky structure; very friable; weakly cemented in some parts; organic coated sand grains; very strongly acid; gradual wavy boundary.

Bh2—63 to 80 inches; black (10YR 2/1) fine sand; weak fine subangular blocky structure; very friable; weakly cemented in some parts; organic coated sand grains; very strongly acid.

The texture of the soil is fine sand or sand to a depth of 80 inches or more. The surface layer is fine sand. The reaction ranges from extremely acid to slightly acid in the A and E horizons and from extremely acid to medium acid in the Bh horizon.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2; or it is neutral and has value of 2 to 5. The thickness of this horizon is 3 to 8 inches.

The E1 horizon has hue of 10YR, value of 4 to 7, and chroma of 1 to 3. The thickness of this horizon is 6 to 24 inches. The E2 and E3 horizons have hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 to 2. Some pedons have an E horizon that has few or common mottles in shades of gray, brown, or yellow. The combined thickness of the E1, E2, and E3 horizons is 42 to 70 inches.

The Bh horizon has hue of 5YR, value of 2 to 4, and chroma of 1 to 4; hue of 7.5YR, value of 3 to 5, and chroma of 1 to 4; or hue of 10YR, value of 2 to 5, and chroma of 1 to 4. Sand grains in this horizon are well coated with organic matter. This horizon is weakly cemented in some parts of some pedons. The Bh horizon extends to a depth of more than 80 inches.

Ridgeland Series

The Ridgeland series consists of nearly level, somewhat poorly drained soils that formed in thick, sandy marine deposits. These soils are in slightly convex areas on the broad flatwoods and along the lower slopes on the gently sloping uplands. A high water table is at a depth of 18 inches for about 1 month during most years. It is at a depth of 18 to 50 inches during most of the remainder of the year. The slopes range from 0 to 2 percent. These soils are sandy,

siliceous, thermic Typic Haplohumods.

Ridgeland soils are geographically associated with Centenary, Hurricane, Leon, Mandarin, Ona, and Ridgewood soils. Centenary and Hurricane soils have a spodic horizon at a depth of more than 50 inches. In addition, Centenary soils are moderately well drained. Leon and Mandarin soils have an E horizon. Leon soils are poorly drained. Ona soils are poorly drained. Ridgewood soils do not have a spodic horizon.

Typical pedon of Ridgeland fine sand; approximately 4.7 miles north of Florida State Highway 16, 2.7 miles east of Bradford County line; 1,500 feet south and 1,800 feet west of the northeast corner of sec. 21, T. 5 S., R. 23 E.

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) fine sand; weak fine granular structure; very friable; many fine and medium roots; many light gray uncoated sand grains, very strongly acid; gradual wavy boundary.

A2—4 to 8 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; many fine and medium roots; very strongly acid; abrupt wavy boundary.

Bh1—8 to 11 inches; very dark brown (10YR 2/2) fine sand; weak medium granular structure; friable; few fine roots; organic coatings on most sand grains; very strongly acid; gradual wavy boundary.

Bh2—11 to 18 inches; very dark grayish brown (10YR 3/2) fine sand; weak medium granular structure; friable; organic coatings on most sand grains; very strongly acid; abrupt wavy boundary.

E1—18 to 30 inches; pale brown (10YR 6/3) fine sand; single grained; loose; many uncoated sand grains; strongly acid; gradual wavy boundary.

E2—30 to 60 inches; light gray (10YR 7/2) fine sand; single grained; loose; strongly acid; gradual wavy boundary.

E3—60 to 65 inches; white (10YR 8/2) fine sand; single grained; loose; strongly acid; abrupt wavy boundary.

B'h1—65 to 75 inches; dark reddish brown (5YR 3/2) fine sand; weak medium granular structure; friable; very strongly acid; gradual wavy boundary.

B'h2—75 to 80 inches; dark brown (7.5YR 3/2) fine sand; weak medium crumb structure; friable; organic coatings on most sand grains; very strongly acid.

The thickness of the solum is 80 inches or more. The reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 2 to 6, and chroma of 1 or 2. The thickness of this horizon is 6 to 9 inches.

The Bh horizon has hue of 10YR, value of 2, and chroma of 1 or 2; hue of 10YR, value of 3, and chroma of 2 to 4; hue of 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 2 or 3, and chroma of 2 or 3. The texture is sand or fine sand. The sand grains are well coated with organic matter. The Bh horizon ranges from 3 to 10 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 to 4. This horizon is 4 to 50 inches thick. The texture is sand or fine sand.

The B'h horizon has the same color and texture range as the Bh horizon. The B'h horizon extends to a depth of more than 80 inches and is weakly cemented in parts of some pedons.

Ridgewood Series

The Ridgewood series consists of deep, nearly level to moderately sloping, somewhat poorly drained, sandy soils that formed in thick beds of sandy marine sediment. These soils are in broad areas on the flatwoods and along the lower slopes on the sandy uplands. A high water table is at a depth of 24 to 40 inches for 2 to 4 months during most years. The slopes range from 0 to 8 percent. These soils are thermic, uncoated Aquic Quartzipsamments.

Ridgewood soils are geographically associated with Albany, Hurricane, Ortega, Osier, and Plummer soils. Albany soils have an argillic horizon at a depth of 40 to 80 inches. Hurricane soils have a spodic horizon. Ortega soils are moderately well drained. Osier soils are poorly drained. Plummer soils have an argillic horizon at a depth of 40 to 80 inches and are poorly drained.

Typical pedon of Ridgewood fine sand, 0 to 5 percent slopes; 0.3 mile south of Florida State Highway 16, 200 feet west of Clay County Road 315; 1,600 feet south and 2,400 feet west of the northeast corner of sec. 18, T. 6 S., R. 26 E.

A—0 to 5 inches; dark gray (10YR 4/1) fine sand; single grained; loose; many fine and medium roots; extremely acid; clear wavy boundary.

C1—5 to 13 inches; pale brown (10YR 6/3) fine sand; single grained; loose; few fine medium roots; very strongly acid; gradual wavy boundary.

C2—13 to 24 inches; very pale brown (10YR 7/4) fine sand; common medium distinct brownish yellow (10YR 6/8) mottles; few light brownish gray (10YR 6/2) streaks; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

C3—24 to 56 inches; light gray (10YR 7/2) fine sand; common fine and medium distinct yellowish red (5YR 5/6) mottles; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

C4—56 to 80 inches; light gray (10YR 7/2) fine sand; single grained; loose; very strongly acid.

The texture is fine sand or sand to a depth of 80 inches or more. The surface is always fine sand. Between depths of 10 and 40 inches, the content of silt plus clay is less than 5 percent. The reaction ranges from extremely acid to medium acid.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2; or it is neutral and has value of 2 to 5. This horizon is 4 to 9 inches thick.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 2 to 8; or hue of 10YR, value of 4, and chroma of 3. Mottles in various shades of red, yellow, brown, and gray are in areas where the water table fluctuates and is within 40 inches of the surface.

Rutlege Series

The Rutlege soils consists of nearly level, very poorly drained, sandy soils that formed in sandy marine sediment. They are in wet depressional areas and along poorly defined drainageways. During most years, a high water table is at a depth of less than 12 inches for more than 6 months. Most depressional areas are ponded for 6 months or more each year. The slopes range from 0 to 2 percent. These soils are sandy, siliceous, thermic Typic Humaquepts.

Rutlege soils are geographically associated with Leon, Plummer, Sapelo, and Surrency soils. Leon, Plummer, and Sapelo soils do not have an umbric epipedon and are poorly drained. In addition, Leon soils have a spodic horizon, Plummer soils have an argillic horizon at a depth of 40 to 80 inches, and Sapelo soils have a spodic horizon within 30 inches of the surface and an argillic horizon at a depth of 40 to 80 inches. Surrency soils have an argillic horizon at a depth of 20 to 40 inches.

Typical pedon of Rutlege mucky fine sand, in an area of Allanton and Rutlege mucky fine sands, depressional; about 2¼ miles south of Johns-Manville plant on U.S. Highway 17, 600 feet southeast of overpass between highway and railroad; Land Grant of sec. 38, T. 6 S., R. 26 E.

A1—0 to 12 inches; black (10YR 3/1) mucky fine sand; weak fine granular structure; loose; many roots; very strongly acid; gradual smooth boundary.

A2—12 to 23 inches; very dark grayish brown (10YR 3/2) mucky fine sand; single grained; loose; few roots; very strongly acid; gradual wavy boundary.

Cg1—23 to 41 inches; grayish brown (2.5Y 5/2) mucky fine sand; few fine faint light brownish gray mottles; single grained; loose; few roots; very strongly acid; gradual wavy boundary.

Cg2—41 to 48 inches; gray (10YR 5/1) fine sand; few fine faint light brownish gray mottles; single grained; loose; strongly acid; gradual wavy boundary.

Cg3—48 to 80 inches; light brownish gray (10YR 6/2) fine sand; few fine distinct brownish yellow (10YR 6/6) mottles; single grained; loose; strongly acid.

The texture of the soil is fine sand or sand to a depth of 80 inches or more. The upper part of the surface layer is mucky fine sand. The reaction ranges from extremely acid to strongly acid.

The A horizon has hue of 10YR to 5Y, value of 2 or 3, and chroma of 2 or less. The content of organic matter is less than 20 percent. This horizon is 10 to 24 inches thick.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 2 or less, with mottles; or hue of 10YR, value of 5 to 7, and chroma of 1 or less, without mottles. This horizon is more than 70 inches thick.

Santee Series

The Santee series consists of nearly level, very poorly drained soils that formed in clayey marine sediment. These soils are in drainageways and on river flood plains. They are frequently flooded, and the water table is near or above the surface for long periods. The slopes are less than 1 percent. These soils are fine, mixed, thermic Typic Argiaquolls.

Santee soils are geographically associated with Goldhead, Meggett, Pelham, Plummer, Rutlege, and Surrency soils. Goldhead, Meggett, Pelham, and Plummer soils are poorly drained. In addition, Goldhead and Plummer soils have an argillic horizon at a depth of 20 to 40 inches, Meggett soils do not have a mollic epipedon, and Plummer soils have an argillic horizon at a depth of 40 to 80 inches. Rutlege soils are sandy throughout. Surrency soils have an umbric epipedon and have an argillic horizon at a depth of 20 to 40 inches.

Typical pedon of Santee fine sandy loam, frequently flooded; 1 mile north of Clay County Road 226 and County Road 209 junction, about 0.7 mile east of Florida State Highway 209; SE¼SE¼ Land Grant of sec. 38, T. 6 S., R. 26 E.

A—0 to 11 inches; black (N 2/0) fine sandy loam, weak fine granular structure; friable; many fine and medium roots; strongly acid; clear wavy boundary.

Btg1—11 to 19 inches; very dark gray (10YR 3/1) clay loam; moderate medium subangular blocky structure; firm, slightly sticky and plastic; many fine roots; clay films on ped faces; slightly acid; gradual wavy boundary.

Btg2—19 to 30 inches; dark gray (10YR 4/1) clay loam; moderate medium subangular blocky structure; firm, slightly sticky and plastic; few fine roots; clay films on ped faces; neutral, gradual wavy boundary.

Btg3—30 to 49 inches gray (10YR 6/1) clay loam; few fine distinct greenish gray (5GY 6/1) mottles; moderate medium subangular blocky structure; slightly sticky and plastic; few fine roots; clay films on ped faces; mildly alkaline; gradual wavy boundary.

BCg—49 to 61 inches; gray (5Y 6/1) sandy clay loam; many fine and medium distinct greenish gray (5GY 6/1) mottles; moderate subangular blocky structure; slightly sticky and plastic; clay films on ped faces; few pockets of sand; mildly alkaline; gradual smooth boundary.

Cg—61 to 80 inches; greenish gray (5BG 6/1) fine sandy loam; massive; mildly alkaline.

The thickness of the solum ranges from 40 to more than 60 inches. The reaction ranges from strongly acid to neutral in the A horizon and from medium acid to mildly alkaline in the Btg, BCg, and Cg horizons.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1; or it is neutral and has value of 2 or 3. The thickness of this horizon is 5 to 11 inches.

The upper part of the Btg horizon has hue of 10YR to 2.5Y, value of 2 or 3, and chroma of 1; or it is neutral and has value of 2 or 3. The middle and lower parts of the Btg horizon have hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. Most pedons are mottled in the lower part. The texture is clay, sandy clay, or clay loam. The Btg horizon is 22 to 50 inches thick.

The BCg horizon has hue of 10YR to 5Y, 5BG, value of 4 to 7, and chroma of 2 or less with greenish gray mottles; or it is neutral and has value of 4 to 7. The texture is clay, sandy clay, sandy clay loam, sandy loam, or fine sandy loam. The thickness of the BCg horizon is 10 to 14 inches.

The Cg horizon has the same colors as the BCg horizon. The texture is variable, ranging from clayey to sandy material.

Sapelo Series

The Sapelo series consists of nearly level, poorly drained soils that formed in beds of sandy and loamy marine deposits. These soils are in the broad areas on the flatwoods. The high water table is within 12 inches of the surface for 1 to 4 months during most years. The slopes range from 0 to 2 percent. These soils are sandy, siliceous, thermic Ultic Haplaquods.

Sapelo soils are geographically associated with Albany, Leon, Meadowbrook, Newnan, Plummer, Rutlege, and Surrency soils. Albany soils are somewhat poorly drained, and they do not have a spodic horizon. Leon soils are sandy to a depth of 80 inches or more. Meadowbrook and Plummer soils do not have a spodic horizon. Newnan soils are somewhat poorly drained. Surrency and Rutlege soils are very poorly drained. In addition, Rutlege and Surrency soils have an umbric epipedon, and Surrency soils have an argillic horizon at a depth of 20 and 40 inches.

Typical pedon of Sapelo fine sand; 100 feet south of Florida State Highway 16 and 0.25 mile west of Florida State Highway 21; 1,600 feet south and 1,300 feet west of northeast corner of sec. 15, T. 6 S., R. 24 E.

Ap—0 to 8 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

E—8 to 16 inches; light gray (10YR 7/2) fine sand; single grained; loose; common fine and medium roots; very strongly acid; clear wavy boundary.

Bh1—16 to 21 inches; black (5YR 2/1) fine sand; weak fine granular structure; friable; common weakly cemented bodies; few fine roots; many organic coated sand grains, few clean sand grains; very strongly acid; clear wavy boundary.

Bh2—21 to 29 inches; dark reddish brown (5YR 3/2) fine sand; common faint distinct black (5YR 2/1) streaks; weak fine granular structure; friable; common weakly cemented bodies; many organic coated sand grains, few clean sand grains; very strongly acid; clear wavy boundary.

E′—29 to 49 inches; light gray (10YR 7/2) fine sand; single grained; loose; very strongly acid; abrupt wavy boundary.

Btg1—49 to 53 inches; light brownish gray (10YR 6/2) sandy clay loam; few fine distinct brownish yellow mottles; moderate medium subangular blocky structure; firm; very strongly acid; gradual wavy boundary.

Btg2—53 to 80 inches; light brownish gray (10YR 6/2) sandy loam; few fine distinct light gray mottles; weak medium subangular blocky structure; friable; very strongly acid.

The thickness of the solum is 80 inches or more. The reaction is extremely acid to strongly acid. Depth to the Bh horizon is 15 to 30 inches, and depth to the argillic horizon ranges from 40 to 80 inches.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1; or it is neutral and has value of 2 to 4. This horizon is 3 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. In places, the horizon has mottles in shades of yellow and brown. The texture is sand or fine sand. The E horizon is 7 to 22 inches thick.

The Bh horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; hue of 7.5YR, value of 3, and chroma of 2; hue of 5YR, value of 2, and chroma of 1 or 2; hue of 5YR, value of 3, and chroma of 2 to 4; or it is neutral and has value of 2. The texture is sand or fine sand. The Bh horizon is 6 to 20 inches thick.

The E horizon has hue of 10YR, value of 5, and chroma of 2, or hue of 10YR, value of 6 or 7, and chroma of 1 to 3, or it is mixed with these colors. The texture is sand or fine sand. This horizon is 20 to 26 inches thick.

The Btg horizon has hue of 5Y, value of 5 or 6, and chroma of 1; hue of 5Y, value of 7 or 8, and chroma of 1 or 2; or hue of 10YR, value of 6 to 8, and chroma of 1 or 2. In places, this horizon has mottles in shades of gray, red, yellow, and brown. The texture is sandy loam, fine sandy loam, or sandy clay loam.

Scranton Series

The Scranton series consists of deep, nearly level, somewhat poorly drained, sandy soils that formed in thick beds of sandy marine sediment. These soils are in broad areas on the flatwoods. A high water table is at a depth of 6 to 18 inches for about 3 to 6 months during most years. The slopes range from 0 to 2 percent. These soils are siliceous, thermic Humaqueptic Psammaquents.

Scranton soils are geographically associated with Leon, Ona, Osier, Plummer, Ridgewood, Sapelo, and Rutlege soils. Leon and Sapelo soils are poorly drained and have a spodic horizon. In addition, Sapelo soils have an argillic horizon below the spodic horizon. Ona, Osier, and Plummer soils are poorly drained. In addition, Ona soils have a spodic horizon, Osier and Plummer soils have a thinner surface horizon than Scranton soils, and also, Plummer soils have an argillic horizon at a depth of 40 to 80 inches. Ridgewood soils have a thinner surface horizon than Scranton soils. Rutlege soils are very poorly drained and have an umbric epipedon.

Typical pedon of Scranton fine sand about 0.75 mile south of U.S. Highway 17 and Florida State Highway 209 junction, 150 feet east of Florida State Highway 209; southwestern part of Clark's Mill Grant of sec. 38, T. 6 S., R. 26 E.

A—0 to 9 inches; very dark grayish brown (10YR 3/2) fine sand; weak fine granular structure; very friable; many fine roots; medium acid; gradual wavy boundary.

Cg1—9 to 22 inches; dark gray (10YR 4/1) fine sand; single grained; loose; medium acid; gradual wavy boundary.

Cg2—22 to 41 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; medium acid; gradual wavy boundary.

Cg3—41 to 61 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; medium acid; gradual wavy boundary.

Cg4—61 to 80 inches; light gray (10YR 7/2) fine sand; single grained; loose; strongly acid.

The texture is fine sand or sand to a depth of 80 inches or more. The surface layer is fine sand. The content of silt plus clay is 5 to 10 percent between depths of 10 to 40 inches. The reaction ranges from very strongly acid to slightly acid in the A horizon and from very strongly acid to medium acid in the other horizons.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 2; or it is neutral and has value of 2 or 3.

The Cg horizon has hue of 10YR, value of 4 to 8, and chroma of 1 or 2. Mottles in the shades of brown or yellow are in some pedons.

Solite Series

The Solite series consists of nearly level, poorly drained soils that are dominantly sandy spoil material from mining operations that have been reworked and shaped by earthmoving equipment. These soil are in broad areas on the flatwoods. A high water table is at a depth of less than 12 inches for 3 to 6 months during most years and at a depth of less than 30 inches for cumulative periods of about 3 to 6 months or more. The slopes range from 0 to 2 percent. These soils are

siliceous, thermic Typic Psammaquents.

Solite soils are geographically associated with Centenary, Hurricane, Leon, Mandarin, Osier, and Pottsburg soils. Centenary soils are moderately well drained. Hurricane and Mandarin soils are somewhat poorly drained. Leon and Pottsburg soils have a spodic horizon. Osier soils have not been disturbed by mining operations.

Typical pedon of Solite fine sand; 0.9 mile north of Warner Road, 3.1 miles west of U.S. Highway 17; 900 feet south and 900 feet west of the northeast corner of sec. 20, T. 7 S., R. 26 E.

A—0 to 5 inches; black (5YR 2/1) fine sand; single grained; loose; few fine roots; extremely acid; gradual wavy boundary.

C1—5 to 48 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; many organic coated sand grains; few fine distinct light gray (10YR 7/1) mottles; extremely acid; gradual wavy boundary.

C2—48 to 60 inches; very dark grayish brown (10YR 3/2) fine sand; single grained; loose; many organic coated sand grains; extremely acid; gradual wavy boundary.

C3—60 to 72 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; many organic coated sand grains; extremely acid; gradual wavy boundary.

C4—72 to 80 inches; dark brown (7.5YR 4/2) fine sand; single grained; loose; many clean sand grains; extremely acid.

The reaction of the soil ranges from extremely acid to medium acid. The texture is fine sand or sand.

The A horizon has hue of 5YR to 10YR, value of 2 to 5, and chroma of 4 or less. If color value is 2 or 3, this horizon is less than 6 inches thick.

The C horizon has hue of 5YR to 10YR, value of 2 to 7, and chroma of 6 or less. Low chromas indicative of wetness are in the upper 20 inches of the soil. Color stratification is evident in many pedons.

Surrency Series

The Surrency series consists of very poorly drained soils that formed in beds of loamy marine sediment. These soils are in ponds, wet depressional areas, and drainageways on the flatwoods. A high water table is within 12 inches of the surface for about 6 months or more. The surface is ponded for about 4 months or more during most years. The slopes are less than 1 percent. These soils are loamy, siliceous, thermic Arenic Umbric Paleaquults.

Surrency soils are geographically associated with Leon, Meggett, Ona, Pelham, Plummer, Rutlege, Santee, and Sapelo soils. All of the associated soils are poorly drained except Rutlege and Santee soils. In addition, Leon, Ona, and Sapelo soils have a spodic horizon, Meggett and Santee soils have an argillic horizon at a depth of less than 20 inches, Plummer soils have an argillic horizon at a depth of more than 40 inches, and Rutlege soils are sandy to a depth of 80 inches or more.

Typical pedon of Surrency fine sand, depressional; about 9 miles northeast of Middleburg; about 600 feet north and 3,200 feet east of the southwest corner of sec. 9, T. 4 S., R. 23 E.

A1—0 to 6 inches; black (N 2/0) fine sand; moderate, medium granular structure; very friable; many fine and medium tree roots; few uncoated sand grains; very strongly acid; clear wavy boundary.

A2—6 to 12 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; few fine and medium roots; few uncoated sand grains; very strongly acid; clear wavy boundary.

Eg—12 to 34 inches; grayish brown (10YR 5/2) fine sand; common fine faint light brownish gray mottles; single grained; loose; few fine and medium roots; many clean sand grains; very strongly acid; gradual smooth boundary.

Btg1—34 to 50 inches; light brownish gray (10YR 6/2) sandy clay loam; few pockets of fine faint grayish brown fine sand; weak fine subangular blocky structure; friable; some clay coated sand grains; few fine roots; very strongly acid; gradual wavy boundary.

Btg2—50 to 80 inches; light gray (10YR 7/2) sandy clay loam; common medium distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; friable; clay films on ped faces; very strongly acid.

The thickness of the solum is 80 inches or more. The reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1; or it is neutral and has value of 2 or 3.

The Eg horizon has hue of 10YR, value of 4 to 6, and chroma of 2; or hue of 10YR, value of 7, and chroma of 1 or 2. In places, this horizon has mottles in shades of gray, yellow, and brown. The texture is fine sand or sand. The Eg horizon ranges from 10 to 24 inches in thickness.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Mottles are in shades of yellow, brown, and red. The texture is sandy loam or sandy clay loam. The average clay content in the upper 20 inches ranges from 15 to 23 percent.

Troup Series

The Troup series consists of nearly level to gently sloping, well drained soils that formed in sandy and loamy marine sediment. These soils are on side slopes and broad, gently rolling uplands. A high water table is at a depth of more than 72 inches. The slopes range from 0 to 5 percent. These soils are loamy, siliceous, thermic Grossarenic Paleudults.

Troup soils are geographically associated with Albany, Blanton, Kershaw, and Penney soils. Albany soils are somewhat poorly drained. Blanton soils are moderately well drained. Kershaw and Penney soils are excessively drained. In addition, they have a sandy texture to a depth of more than 80 inches and do not have an argillic horizon.

Typically pedon of Troup sand, 0 to 5 percent slopes; 0.95 mile north of Florida State Highway 214, 2 miles east of Florida State Highway 21; 500 feet south and 300 feet east of northwest corner of sec. 22, T. 8 S., R 23 E.

A—0 to 4 inches; grayish brown (10YR 5/2) sand; single grained; loose; very strongly acid; gradual wavy boundary.

E—4 to 64 inches; light yellowish brown (10YR 6/4) sand; single grained; loose; very strongly acid; clear wavy boundary.

Bt—64 to 80 inches; yellowish red (5YR 5/8) sandy loam; weak medium subangular blocky structure; very friable; very strongly acid.

The thickness of the solum is 80 inches or more. The reaction ranges from very strongly acid to medium acid in the surface and subsurface layers and from very strongly acid or strongly acid in the subsoil.

The A or Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 2. This horizon is 4 or 5 inches thick.

The E horizon has hue of 10YR, value of 6 or 7, and chroma of 3 to 6. Most pedons have few or common uncoated sand grains. The texture is sand or fine sand. The combined thickness of the A and E horizons is 37 to 64 inches.

The Bt horizon has hue of 5YR or 7.5YR, value of 5 to 7, and chroma of 6 to 8. The texture is sandy loam or sandy clay loam. The thickness of this horizon is 12 to more than 30 inches. The content of plinthite is less than 5 percent.

Wesconnett Series

The Wesconnett series consists of nearly level, very poorly drained soils that formed in thick beds of sandy marine deposits. These soils are in broad and narrow drainageways on the flatwoods. The high water table is within 12 inches of the surface for most of the year. Floodwater covers the surface for 4 months or more. The slopes are 0 to 2 percent. These soils are sandy, siliceous, thermic Typic Haplaquods.

Wesconnett soils are geographically associated with Allanton, Leon, Lynn Haven, Osier, Pottsburg, and Rutlege soils. Unlike Wesconnett soils, all of the associated soils are poorly drained except Allanton and Rutlege soils. In addition, Allanton, Leon, Lynn Haven, and Pottsburg soils have an E horizon immediately below the A horizon. Pottsburg and Allanton soils have A and E horizons combined that are more than 40 inches thick. Osier and Rutlege soils do not have a spodic horizon.

Typical pedon of Wesconnett fine sand, frequently flooded; 2,500 feet north and 250 feet east of the SW¼ corner of sec. 3, T. 6 S., R. 23 E.

A—0 to 12 inches; very dark brown (10YR 2/2) fine sand; weak fine granular structure; very friable; very strongly acid; gradual wavy boundary.

Bh1—12 to 30 inches; black (10YR 2/1) fine sand; weak fine subangular blocky structure; very friable; common fine roots; organic coated sand grains; very strongly acid; gradual wavy boundary.

Bh2—30 to 41 inches; very dark gray (10YR 3/1) fine sand; weak fine subangular blocky structure; friable; many clean sand grains; strongly acid; gradual wavy boundary.

Bh3—41 to 51 inches; dark reddish brown (5YR 3/2) fine sand; weak fine subangular blocky structure; friable; common clean sand grains and organic coated sand grains; strongly acid; clear wavy boundary.

E—51 to 65 inches; dark brown (10YR 4/3) fine sand; single grained; loose; strongly acid; clear wavy boundary.

B'h—65 to 80 inches; black (10YR 2/1) fine sand; weak fine subangular blocky structure; friable; well coated with organic matter sand grains; strongly acid.

The solum is more than 80 inches thick. The reaction ranges from extremely acid to slightly acid.

The A horizon has hue of 10YR, value of 2, and chroma of 1 or 2; or it is neutral and has value of 2. This horizon is 8 to 14 inches thick.

The Bh horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or hue of 5YR, value of 2 or 3, and chroma of 1 or 2. Sand grains are well coated with organic matter. This horizon is weakly cemented in parts of some pedons. The texture is sand or fine sand. The thickness of the Bh horizon ranges from 12 to 40 inches.

The E horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The texture is sand or fine sand. This horizon is 10 to 32 inches thick.

The B'h horizon has the same color and texture range as the Bh horizon.

Formation of the Soils

In this section, the factors of soil formation are discussed and related to the soils in Clay County. In addition, the processes of horizon differentiation are explained.

Factors of Soil Formation

Soil is produced by forces of weathering and other processes acting on the parent material that has been deposited or accumulated by geological agencies. The kind of soil that forms depends on five major factors. These factors are—

- the type of parent material
- the climate under which the soil material has existed since accumulation
- the plant and animal life in and on the soil
- the relief, or lay of the land
- the length of time the forces of soil formation have acted on the soil material.

The five soil-forming factors are interdependent; each modifies the effects of the others. Any one of the 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 only quartz sand, the soil generally has only weakly expressed horizons. In some places, the effect of the parent material is modified greatly by the effects of climate, relief, and plants and animals in and on the soil. As a soil forms, it is influenced by the five factors, but in some places one factor can have a predominant effect. A modification or variation in any of these factors results in a different kind of soil.

Parent Material

The parent material of the soils in Clay County consists mostly of deposits of marine origin. These deposits were mostly quartz sand with varying amounts of clay and shell fragments. Clay is more abundant in soils that formed in the sediment of marine terraces and in lagoons, and it is virtually absent on shoreline ridges where most deposits are eolian sands. Parent material was transported by ocean current. The ocean covered the area a number of times during the Pleistocene age.

The parent material in Clay County differs somewhat in mineral and chemical composition and in physical structure. The main physical differences, such as those between sand, silt, and clay, can be observed in the field. Other differences, such as mineral and chemical composition, are important to soil formation and affect the present physical and chemical characteristics of the soils. Many differences among soils in the county, reflect original differences in the parent material as it was laid down.

Some organic soils are throughout the county. They formed in the partly decayed remains of wetland vegetation.

Climate

Precipitation, temperature, humidity, and wind are the climatic forces that act on the parent material of the soils in Clay County. These forces also cause some variation in the plant and animal life on and in the soils; and, thus, influence changes in the parent material and in soil formation.

Clay County has a warm, humid climate characterized by long, hot summers and short, mild winters. The mean annual temperature is about 69 degrees, and the mean annual precipitation is about 52 inches. The Atlantic Ocean, the St. Johns River, and the inland lakes and streams have a moderating effect on summer and winter temperatures. Rainfall percolates downward through the soil, leaching it of many plant nutrients. This causes a strongly acid condition in many of the soils. The translocation of soluble base material and the less soluble colloidal material, results in reduced fertility and a more sandy surface. Increasing rainfall creates swelling of shallow clay and erosion of soils on slopes, which can have a detrimental effect on roads and buildings.

Plants and Animals

Plants have been the principal biological factor in the

formation of soils in Clay County; but animals, insects, bacteria, and fungi have also been important agents. Plant and animal life furnishes organic matter and helps bring plant nutrients from the lower horizons to the upper horizons. Differences in the content of organic matter, nitrogen, and nutrients in the soils and differences in soil structure and porosity are caused by plants and animals.

Micro-organisms and fungi break down minerals and decompose organic matter. These organisms are most numerous in the surface layer. Earthworms and small animals inhabit the soil, alter its chemical composition, and mix it with other soil material.

Man also has influenced the formation of the soils by clearing the forests, cultivating the soils, draining wet areas, and introducing new kinds of plants. Sometimes, the complex of living organisms has been drastically changed because of man's activities.

Relief

Relief, or lay of the land, affects soil formation because it influences microclimate and water relationships. Soil temperature is influenced by altitude and by the orientation of slopes toward or away from the sun. Relief controls drainage, runoff, erosion, soil fertility, and vegetation. Soil formation is retarded on the steeper slopes because soil material and organic matter tend to gravitate downslope.

Because the terrain of Clay County is nearly level to rolling, relief has a significant effect on the soils. Because the parent material of most of the soils was sandy marine deposits, the soils are sandy. Because sandy soils have low available water capacity and easily become droughty, most of the water available to plants comes from the water table. As a result, the depth to the water table becomes extremely important in determining the type of vegetation that grows in a particular area.

In addition, the depth to the water table affects internal drainage. On the sand ridges, where the water table is deep and the soils are highly leached, organic matter and soluble plant nutrients and colloidal clays are carried rapidly downward through the sandy soil.

In the flatwood areas, the water table is commonly at or near the surface, and it rarely drops below a depth of 5 feet. Organic matter is translocated down a short distance and forms a humus-rich spodic horizon, or Bh horizon. This horizon is referred to locally as a hardpan.

In the low areas or depressions, where the water table is normally above the surface, muck accumulates under the marsh or swamp vegetation. As these plants die, the residue accumulates in the water where oxygen is excluded, and it slowly and only partly decays. The amount of muck that accumulates depends mostly on the depth and duration of standing water. In some wet areas, accumulations of organic matter have formed a thick, black topsoil on the mineral soil instead of a muck surface layer.

Time

Time is an important factor in soil formation. The physical and chemical changes brought about by climate, plants and animals, and relief are slow. The length of time needed to convert raw, geologic material into soil varies according to the nature of the geologic material and the interaction of the other factors. Some basic minerals from which the soils are formed weather fairly rapidly, while other minerals are chemically inert and show little change over long periods. The translocation of fine particles in the soil to form the various horizons varies under different conditions, but the processes always take a relatively long time.

In Clay County, the dominant geologic material is inactive. The sand is almost pure quartz and is highly resistant to weathering. The finer textured silt and clay are the products of earlier weathering.

Relatively little geologic time has elapsed since the material, in which the soils in Clay County formed, was laid down or emerged from the sea. The loamy and clayey horizons formed in place through the process of clay translocation.

Processes of Horizon Differentiation

The processes involved in the formation of soil horizons, or horizon differentiation, in Clay County are accumulation of organic matter, leaching of calcium carbonates and bases, reduction and transfer of iron, and formation and translocation of silicate clay material. In the formation of most soils in the county, two or more of these processes have been active.

Some organic matter has accumulated in the surface layer of all of the soils in Clay County to form an A horizon or an O horizon. In many places, cultivation has mixed the A horizon or the O horizon with material from the underlying horizons. The content of organic matter ranges from low to high.

Leaching of carbonates and bases has occurred in nearly all of the soils. The leaching of bases in soils generally precedes translocation of silicate clay material. Most soils in the county are leached to varying degrees. Leaching has contributed to the formation of horizons.

The chemical reduction and transfer of iron, or

gleying, is evident in the soils that have a high water table. The well drained soils, however, do not show evidence of this process. Gleying occurs because of wet conditions. The gray color in the subsoil and grayish mottles in other horizons indicate the reduction and loss of iron. In some sandy soils, however, the gray color is not caused by wetness; it is the color of the sand grains. Segregation of iron is indicated by reddish brown mottles and concretions.

The translocation of silicate clay, colloidal organic matter, and iron oxides has contributed to horizon development in many of the soils in the county. Movement of clay, organic matter, or iron is evident in many of the soils; for example, a leached E horizon of light color, in a Bt or Bh horizon in which sand grains are bridged and coated with clay or colloidal organic matter, or a few patchy clay films on faces of peds and in root channels.

The soil-forming processes have resulted in a succession of layers or horizons in the soil. These horizons can differ in one or more properties, such as in color, texture, structure, consistence, and reaction. They also can be thick or thin. Horizons can be the result of the activity of soil-forming processes at different periods.

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Glossary

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

AEBC soil. A soil having an A, an E, a B, and a C horizon.

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

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

Alkali (sodic) soil. 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.

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

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

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

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

Bedding. A method of controlling excess water in areas of soils used for cultivated crops and tree crops. The surface soil is plowed into regularly spaced elevated beds, and the crops are planted on the beds. The ditches between the beds drain the excess water.

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

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

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

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

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

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

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

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

less than 45 percent sand, and less than 40 percent silt.

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

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.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

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

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

Compressible (in tables). The volume of soft soil decreases excessively under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

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

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

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

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

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

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

Cemented.—Hard; little affected by moistening.

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

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

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

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

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

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

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

blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

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

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

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

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

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

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

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

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

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

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, such as fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

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

Fast intake (in tables). The movement of water into the soil is rapid.

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

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight,

after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

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

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

Flatwoods. Broad, nearly level, poorly drained soils characteristically vegetated with open woods of pine, saw palmetto, and pineland threeawn.

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

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant that is not a grass or a sedge.

Fragile (in tables). The soil is easily damaged by use or disturbance.

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

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

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

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

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

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

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

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.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

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

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

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

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

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

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

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

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

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The

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

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

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

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the plants that are the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material. This contrasts with percolation, which is movement of water through soil layers or material.

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

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

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—
Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
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.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Lamallae. Thin, slightly wavy layers of soil enriched with clay and sometimes with iron or organic matter, or both. These layers are brighter in color than the soil between the layers. Individual layers are generally ⅛ inch to 1 inch or more thick and are generally repeated vertically at intervals of 1 inch to 6 inches.

Large stones (in tables). Rock fragments that are 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

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

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

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

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

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

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

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

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

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

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

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

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

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

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

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

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

Open space. A relatively undeveloped green or wooded area provided mainly within an urban area to minimize feelings of congested living.

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

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

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

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

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

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

Percolation. The downward movement of water through the soil.

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

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

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

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

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

Piping (in tables). Subsurface tunnels or pipelike cavities are formed by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the

same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). In these areas, surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Rangeland. Land on which the potential climax vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor, on the basis of how much the present plant community has departed from the potential.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of the acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH value are—

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Rippable bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). There is a shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). An otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, such as zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). There is a risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. This contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically, a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Based on data recorded in the period 1951-1980 at Jacksonville, Florida]

Month	Temperature					Precipitation			
	Monthly normal mean	Normal daily maximum	Normal daily minimum	Mean number of days with temperature of-- 90° F or higher	Mean number of days with temperature of-- 32° F or lower	Normal Total	Maximum Total	Minimum Total	Mean number of days with rainfall of 0.01 inch or more
	°F	°F	°F			In	In	In	
January------	53.2	64.6	41.7	0	5	3.07	7.29	0.06	8
February-----	55.1	66.8	43.3	0	3	3.48	8.85	0.52	8
March--------	61.3	73.3	49.3	0	1	3.72	10.18	0.18	8
April--------	67.7	79.7	55.7	2	0	3.32	11.61	0.17	7
May----------	74.1	85.2	63.0	8	0	4.91	10.43	0.61	8
June---------	79.0	88.9	69.1	16	0	5.37	12.90	2.19	12
July---------	81.3	90.7	71.8	23	0	6.54	16.21	1.97	15
August-------	81.0	90.2	71.8	21	0	7.15	16.24	1.92	14
September----	78.2	86.9	69.4	10	0	7.26	19.36	1.02	13
October------	69.5	79.7	59.2	1	0	3.41	13.44	0.16	8
November-----	60.8	72.4	49.2	0	1	1.94	7.85	*	6
December-----	54.8	66.3	43.2	0	4	2.59	7.09	0.04	8

* Trace.

TABLE 2.--FREEZE DATA

[Information extracted from U.S. Department of Commerce, NOAA, "Climatology of the United States No. 60-8, Climate of Florida, Revised June 1972." Data recorded at Jacksonville International Airport, elevation 26 feet]

Freeze threshold temperature	Mean date of last spring occurrence	Mean date of first fall occurrence	Mean number of days between dates	Years of record, spring	Number of occurrences in spring	Years of record, fall	Number of occurrences in fall
°F							
32	February 6	December 16	313	30	24	30	15
28	January 22	December 21	336	30	17	30	11
24	January 6	December 28	356	30	8	30	5
20	*	*	---	30	2	30	0
16	*	*	---	30	0	30	0

* Frequency of occurence in either spring or fall is 1 year in 10, or less.

TABLE 3.--SOIL RATINGS AND LIMITATIONS BY GENERAL SOIL MAP UNITS FOR SELECTED USES

[The overall rating for the map unit is based on the rating for the most dominant soil or soils]

Map symbol, map unit name, and component soils	Percentage of survey area	Percentage of map unit	Soil suitability for--		Potential productivity for--	Degree and kind of limitations for--		
			Cropland	Pasture	Pine trees	Sanitary facilities*	Building sites**	Recreation areas***
1. Penney-Kershaw-Ortega	12	---	Very poor	Moderate	Moderate	Slight****	Slight	Severe.
Penney	---	46	Very poor: droughty, low fertility.	Moderate: droughty, low fertility.	Moderate: equipment limitation, seedling mortality, plant competition.	Slight	Slight	Severe: too sandy.
Kershaw	---	29	Very poor: droughty, low fertility.	Moderate: droughty, low fertility.	Low: equipment limitation, seedling mortality.	Slight	Slight	Severe: too sandy.
Ortega	---	14	Poor: droughty.	Well	Moderate: equipment limitation, seedling mortality, plant competition.	Moderate: wetness.	Slight	Severe: too sandy.
2. Ortega-Penney-Centenary	14	---	Poor	Well	Moderate	Slight****	Slight	Severe.
Ortega	---	31	Poor: droughty.	Well	Moderate: equipment limitation, seedling mortality, plant competition.	Moderate: wetness.	Slight	Severe: too sandy.
Penney	---	28	Very poor: droughty, low fertility.	Moderate: droughty, low fertility.	Moderate: equipment limitation, seedling mortality, plant competition.	Slight	Slight	Severe: too sandy.
Centenary	---	11	Poor: droughty, low fertility.	Well	Moderate: equipment limitation, seedling mortality, plant competition.	Moderate: wetness.	Slight	Severe: too sandy.

See footnotes at end of table.

TABLE 3.--SOIL RATINGS AND LIMITATIONS BY GENERAL SOIL MAP UNITS FOR SELECTED USES--Continued

Map symbol, map unit name, and component soils	Percentage of survey area	Percentage of map unit	Soil suitability for--		Potential productivity for--	Degree and kind of limitations for--		
			Cropland	Pasture	Pine trees	Sanitary facilities*	Building sites**	Recreation areas***
3. Hurricane-Leon-Mandarin	29	---	Poor	Well	Moderate	Severe	Moderate	Severe.
Hurricane	---	31	Poor: wetness, low fertility, droughty.	Well	Moderately high: equipment limitation, seedling mortality, plant competition.	Severe: wetness, poor filter.	Moderate: wetness.	Severe: too sandy.
Leon	---	17	Very poor: wetness, low fertility.	Moderate: wetness, low fertility.	Moderate: equipment limitation, seedling mortality, plant competition.	Severe: wetness, poor filter.	Severe: wetness.	Severe: wetness.
Mandarin	---	12	Poor: droughty, wetness, low fertility.	Well	Moderate: equipment limitation, seedling mortality, plant competition.	Severe: wetness.	Moderate: wetness.	Severe: too sandy.
4. Albany-Blanton-Newnan	7	---	Poor	Well	Moderately high	Severe	Moderate	Moderate.
Albany	---	31	Poor: wetness, low fertility.	Well	Moderately high: equipment limitation, seedling mortality, plant competition.	Severe: wetness.	Severe: wetness.	Severe: too sandy.
Blanton	---	20	Poor: droughty, low fertility.	Well	Moderately high: equipment limitation, seedling mortality.	Moderate: wetness.	Slight	Severe: too sandy.
Newman	---	14	Poor: wetness, low fertility.	Well	Moderately high: equipment limitation, seedling mortality.	Severe: wetness.	Moderate: wetness.	Severe: too sandy.
5. Osier-Plummer	2	---	Very poor	Moderate	Moderately high	Severe	Severe	Severe.
Osier	---	52	Very poor: wetness, low fertility.	Moderate: wetness.	Moderately high: wetness, equipment limitation, plant competition.	Severe: wetness, poor filter.	Severe: wetness.	Severe: wetness, too sandy.
Plummer	---	31	Very poor: wetness, low fertility.	Moderate: wetness.	Moderately high: equipment limitation, seedling mortality, plant competition.	Severe: wetness, percs slowly	Severe: wetness.	Severe: wetness, too sandy.

See footnotes at end of table.

TABLE 3.--SOIL RATINGS AND LIMITATIONS BY GENERAL SOIL MAP UNITS FOR SELECTED USES--Continued

Map symbol, map unit name, and component soils	Percentage of survey area	Percentage of map unit	Soil suitability for--		Potential productivity for--	Degree and kind of limitations for--		
			Cropland	Pasture	Pine trees	Sanitary facilities*	Building sites**	Recreation areas***
6. Pelham-Meggett--	5	---	Very poor------	Moderate-------	Moderately high---------	Severe-------	Severe-------	Severe.
Pelham--------	---	47	Very poor: wetness.	Moderate: wetness.	Moderately high: seedling mortality, equipment limitation, plant competition.	Severe: wetness.	Severe: wetness.	Severe: wetness, too sandy.
Meggett-------	---	36	Very poor: wetness, restricted root zone.	Moderate: wetness.	High: plant competition, seedling mortality, equipment limitation.	Severe: wetness, percs slowly	Severe: wetness.	Severe: wetness.
7. Leon-Mandarin-Pottsburg------	18	---	Very poor------	Moderate-------	Moderate----------	Severe-------	Severe-------	Severe.
Leon----------	---	35	Very poor: wetness.	Moderate: wetness, low fertility.	Moderate: seedling mortality, equipment limitation, plant competition.	Severe: wetness, poor filter.	Severe: wetness.	Severe: wetness, too sandy.
Mandarin------	---	17	Poor: wetness.	Well----------	Moderate: seeddling mortality, equipment limitation, plant competition.	Severe: wetness. poor filter.	Moderate: wetness.	Severe: too sandy.
Pottsburg-----	---	14	Very poor: wetness.	Moderate: wetness, low fertility.	Moderate: equipment limitation, seedling mortality, plant competition.	Severe: wetness, poor filter.	Severe: wetness.	Severe: wetness, too sandy.
8. Sapelo-Meadowbrook-Leon-----	7	---	Very poor------	Moderate-------	Moderate----------	Severe-------	Severe-------	Severe.
Sapello-------	---	51	Very poor: wetness, low fertility.	Moderate: wetness, low fertility.	Moderate: seedling mortality, equipment limitation, plant competition.	Severe: wetness, poor filter.	Severe: wetness.	Severe: wetness, too sandy.
Meadowbrook---	---	21	Very poor: wetness, low fertility.	Moderate: wetness, low fertility.	Moderately high: seedling mortality, equipment limitation, plant competition.	Severe: wetness, poor filter.	Severe: wetness.	Severe: wetness, too sandy.
Leon----------	---	10	Very poor: wetness, low fertility.	Moderate: wetness, low fertility.	Moderate: seedling mortality, equipment limitation, plant competition.	Severe: wetness, poor filter.	Severe: wetness.	Severe: wetness, too sandy.

See footnotes at end of table.

TABLE 3.--SOIL RATINGS AND LIMITATIONS BY GENERAL SOIL MAP UNITS FOR SELECTED USES--Continued

Map symbol, map unit name, and component soils	Percentage of survey area	Percentage of map unit	Soil suitability for--		Potential productivity for--	Degree and kind of limitations for--		
			Cropland	Pasture	Pine trees	Sanitary facilities*	Building sites**	Recreation areas***
9. Maurepas-Pamlico	3	---	Very poor	Very poor	Low	Severe	Severe	Severe.
Maurepas	---	39	Very poor: flooding, ponding, wetness.	Very poor: flooding, ponding, wetness.	Low: seedling mortality, equipment limitation, plant competition.	Severe: flooding, ponding, poor filter.	Severe: flooding, ponding, low strength	Severe: flooding, ponding, excess humus.
Pamlico	---	37	Very poor: flooding, ponding, wetness.	Very poor: flooding, ponding, wetness.	Low: seedling mortality, equipment limitation, plant competition.	Severe: flooding, ponding, poor filter.	Severe: flooding, ponding, low strength	Severe: excess wetness. excess humus.
10. Allanton-Rutlege-Osier	3	---	Very poor	Very poor	Low	Severe	Severe	Severe.
Allanton	---	40	Very poor: flooding, ponding, wetness.	Very poor: flooding, ponding, wetness.	Low: seedling mortality, equipment limitation, plant competition, wetness.	Severe: flooding, ponding, wetness.	Severe: flooding, ponding, wetness.	Severe: flooding, ponding, wetness.
Rutlege	---	32	Very poor: flooding, ponding, wetness.	Very poor: flooding, ponding, wetness.	Low: seedling mortality, equipment limitation, plant competition, wetness.	Severe: flooding, ponding, wetness.	Severe: flooding, ponding, wetness.	Severe: flooding, ponding, wetness.
Osier	---	8	Very poor: flooding, wetness.	Very poor: flooding, wetness.	Low: seedling mortality, equipment limitation, plant competition, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness, too sandy.

* Ratings apply to septic tank absorption fields.
** Ratings apply to dwellings without basements, small commercial buildings, and local roads and streets.
*** Ratings apply to camp areas, picnic areas, and playgrounds.
**** Because of poor filtration, ground water contamination may be a hazard in areas that have a concentration of septic tank absorption fields.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1	Albany fine sand, 0 to 5 percent slopes	9,015	2.3
2	Blanton fine sand, 0 to 5 percent slopes	5,655	1.5
3	Hurricane fine sand, 0 to 5 percent slopes	27,878	7.4
4	Ocilla loamy fine sand, 0 to 5 percent slopes	3,614	1.0
5	Penney fine sand, 0 to 5 percent slopes	29,348	7.7
6	Mandarin fine sand	20,408	5.4
7	Centenary fine sand, 0 to 5 percent slopes	8,241	2.2
8	Sapelo fine sand	16,403	4.3
9	Leon fine sand	43,528	11.5
10	Ortega fine sand, 0 to 5 percent slopes	22,235	5.9
11	Allanton and Rutlege mucky fine sands, depressional	8,430	2.2
12	Surrency fine sand, depressional	2,415	0.6
13	Meggett fine sandy loam	6,387	1.7
14	Ortega-Urban land complex, 0 to 5 percent slopes	2,606	0.7
15	Quartzipsamments, excavated	1,417	0.4
16	Hurricane-Urban land complex, 0 to 5 percent slopes	2,246	0.6
17	Plummer fine sand	2,325	0.6
18	Ridgewood fine sand, 0 to 5 percent slopes	13,146	3.5
19	Osier fine sand	5,930	1.6
20	Scranton fine sand	1,570	0.4
21	Goldhead fine sand	1,224	0.3
22	Pelham fine sand	9,163	2.4
23	Sapelo-Urban land complex	1,194	0.3
24	Urban land	1,487	0.4
25	Maurepas muck, flooded	6,229	1.6
27	Pamlico muck	3,540	0.9
28	Santee fine sandy loam, flooded	322	0.1
29	Rutlege-Osier complex, flooded	20,810	5.5
30	Arents, sandy	251	0.1
31	Pottsburg fine sand	16,478	4.3
32	Blanton fine sand, 5 to 8 percent slopes	850	0.2
34	Penney fine sand, 5 to 8 percent slopes	3,656	1.0
36	Ortega fine sand, 5 to 8 percent slopes	1,435	0.4
37	Ridgewood fine sand, 5 to 8 percent slopes	844	0.2
38	Surrency fine sand, flooded	2,184	0.6
39	Meadowbrook sand, flooded	4,747	1.3
40	Ousley fine sand, flooded	1,153	0.3
41	Albany fine sand, 0 to 5 percent slopes, flooded	611	0.2
42	Osier fine sand, flooded	2,603	0.7
43	Pamlico muck, flooded	3,378	0.9
46	Plummer fine sand, depressional	1,186	0.3
47	Newnan fine sand	4,738	1.3
49	Sapelo-Meadowbrook frequently flooded, complex	1,095	0.3
50	Leon fine sand, flooded	1,816	0.5
51	Pottsburg fine sand, flooded	1,438	0.4
52	Meggett fine sandy loam, flooded	1,696	0.4
54	Troup sand, 0 to 5 percent slopes	1,294	0.3
56	Kershaw sand, 0 to 8 percent slopes	13,031	3.4
58	Allanton fine sand, frequently flooded	7,156	1.9
59	Lynn Haven fine sand	2,995	0.8
60	Ridgeland fine sand	1,528	0.4
61	Wesconnett fine sand, flooded	1,664	0.4
62	Neilhurst fine sand, undulating	5,865	1.5
63	Solite fine sand	5,375	1.4
64	Ona fine sand	2,726	0.7
65	Meadowbrook sand	7,814	2.1
*	Water	2,635	0.7
	Total	379,008	100.0

* Bodies of water less than 40 acres.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Land capability	Improved bermudagrass	Bahiagrass
		AUM*	AUM*
1---------- Albany	IIIe	6.5	6.5
2---------- Blanton	IIIs	4.5	4.5
3---------- Hurricane	IIIw	7.0	6.5
4---------- Ocilla	IIIw	7.0	6.5
5---------- Penney	IVs	4.5	4.5
6---------- Mandarin	VIs	3.5	3.5
7---------- Centenary	IIIs	4.5	4.5
8---------- Sapelo	IVw	6.5	6.0
9---------- Leon	IVw	6.5	6.0
10---------- Ortega	IIIs	4.5	4.5
11---------- Allanton and Rutlege	VIIw	---	---
12---------- Surrency	VIw	5.5	6.0
13---------- Meggett	IVw	6.5	6.0
14. Ortega-Urban land			
15. Quartzipsamments			
16. Hurricane-Urban land			
17---------- Plummer	IVw	---	---

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Improved bermudagrass	Bahiagrass
		AUM*	AUM*
18---------- Ridgewood	IVs	4.5	4.5
19---------- Osier	Vw	6.5	6.5
20---------- Scranton	IIIw	7.0	6.5
21---------- Goldhead	IIIw	7.0	6.5
22---------- Pelham	IIIw	---	6.5
23. Sapelo-Urban land			
24. Urban land			
25---------- Maurepas	VIIIw	---	---
27---------- Pamlico	VIIw	---	---
28---------- Santee	VIw	5.5	6.0
29---------- Rutlege-Osier	Vw	---	---
30---------- Arents	---	3.5	3.5
31---------- Pottsburg	IVw	6.5	6.0
32---------- Blanton	lVs	4.5	4.5
34---------- Penney	VIs	3.5	3.5
36---------- Ortega	IVs	4.5	4.5
37---------- Ridgewood	IVs	4.5	4.5
38---------- Surrency	VIw	5.5	6.0
39---------- Meadowbrook	VIw	5.5	6.0
40---------- Ousley	IIIw	4.5	4.5

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Improved bermudagrass	Bahiagrass
		AUM*	AUM*
41---------- Albany	IIIw	7.0	6.5
42---------- Osier	Vw	6.5	6.5
43---------- Pamlico	VIIw	---	---
46---------- Plummer	Vw	6.5	6.5
47---------- Newnan	IIIs	4.5	4.5
49---------- Sapelo-Meadowbrook	VIw	5.5	6.0
50---------- Leon	VIw	6.5	6.0
51---------- Pottsburg	IVw	6.5	6.0
52---------- Meggett	VIw	5.5	6.0
54---------- Troup	IIIs	4.5	4.5
56---------- Kershaw	VIIs	3.5	3.5
58---------- Allanton	Vw	6.5	6.5
59---------- Lynn Haven	IVw	6.5	6.0
60---------- Ridgeland	IIIw	7.0	6.5
61---------- Wesconnett	VIw	5.5	6.0
62---------- Neilhurst	VIs	3.5	3.5
63---------- Solite	IVw	6.5	6.0
64---------- Ona	IIIw	7.0	6.5
65---------- Meadowbrook	IVw	6.5	6.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one cow with calf, one horse, one steer, or five hogs) for 30 days.

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]

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
1 Albany	11W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	85	11	Loblolly pine, slash pine, longleaf pine.
							Loblolly pine	95	9	
							Longleaf pine	80	7	
							Water oak	---	---	
							Live oak	---	---	
							Laurel oak	---	---	
							Sweetgum	---	---	
2 Blanton	11S	Slight	Moderate	Moderate	Slight	Slight	Slash pine	90	11	Slash pine, loblolly pine, longleaf pine.
							Loblolly pine	80	8	
							Longleaf pine	70	6	
							Bluejack oak	---	---	
							Turkey oak	---	---	
							Southern red oak	---	---	
							Live oak	---	---	
							Water oak	---	---	
							Laurel cherry	---	---	
3 Hurricane	11W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	90	11	Slash pine, longleaf pine.
							Longleaf pine	75	6	
							Loblolly pine	90	9	
							Bluejack oak	---	---	
							Post oak	---	---	
							Water oak	---	---	
4 Ocilla	11W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	90	11	Loblolly pine, slash pine.
							Loblolly pine	85	8	
							Longleaf pine	77	7	
							Water oak	---	---	
							Laurel oak	---	---	
5 Penney	8S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	70	8	Sand pine, slash pine, longleaf pine.
							Longleaf pine	60	4	
							Sand pine	75	4	
							Turkey oak	---	---	
							Bluejack oak	---	---	
							Post oak	---	---	
							Live oak	---	---	
							Blackjack oak	---	---	
6 Mandarin	8S	Slight	Moderate	Severe	Slight	Moderate	Slash pine	70	8	Slash pine, longleaf pine.
							Longleaf pine	60	4	
							Live oak	---	---	
							Post oak	---	---	
							Water oak	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
7 Centenary	11S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	85	11	Slash pine, loblolly pine, longleaf pine.
							Loblolly pine	85	8	
							Longleaf pine	72	6	
							Live oak	---	---	
							Water oak	---	---	
							Turkey oak	---	---	
							Post oak	---	---	
							Bluejack oak	---	---	
8 Sapelo	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	77	10	Loblolly pine, slash pine.
							Loblolly pine	77	7	
							Longleaf pine	65	5	
							Water oak	---	---	
							Live oak	---	---	
9 Leon	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine	70	8	Slash pine.
							Longleaf pine	65	5	
							Water oak	---	---	
							Live oak	---	---	
10 Ortega	10S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, loblolly pine, longleaf pine.
							Longleaf pine	70	6	
							Loblolly pine	80	8	
							Blackjack oak	---	---	
							Post oak	---	---	
							Turkey oak	---	---	
11:										
Allanton	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress	75	2	**
							Baldcypress	---	---	
							Blackgum	---	---	
							Sweetbay	---	---	
							Red maple	---	---	
							Swamp tupelo	---	---	
							Pond pine	---	---	
Rutlege	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress	75	2	**
							Baldcypress	---	---	
							Blackgum	---	---	
							Sweetbay	---	---	
							Red maple	---	---	
							Swmap tupelo	---	---	
							Pond pine	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
12 Surrency	11W	Slight	Severe	Severe	Slight	Severe	Slash pine	90	11	**
							Loblolly pine	95	9	
							Sweetgum	90	7	
							Blackgum	---	---	
							Water oak	---	---	
							Baldcypress	---	---	
							Water tupelo	---	---	
13 Meggett	13W	Slight	Severe	Severe	Severe	Severe	Slash pine	100	13	Slash pine, loblolly pine.
							Loblolly pine	100	11	
							Pond pine	75	---	
							Red maple	---	---	
							Laurel oak	---	---	
							Water oak	---	---	
							Sweetgum	---	---	
							Blackgum	---	---	
17 Plummer	11W	Slight	Severe	Severe	Slight	Moderate	Slash pine	88	11	Loblolly pine, slash pine.
							Loblolly pine	91	9	
							Longleaf pine	70	6	
							Red maple	---	---	
							Sweetgum	---	---	
							Water oak	---	---	
							Live oak	---	---	
18 Ridgewood	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, longleaf pine.
							Longleaf pine	65	5	
							Laurel oak	---	---	
							Live oak	---	---	
							Water oak	---	---	
							Southern redoak	---	---	
19 Osier	11W	Slight	Severe	Severe	Slight	Moderate	Slash pine	85	11	Slash pine, loblolly pine.
							Loblolly pine	87	9	
							Longleaf pine	69	5	
20 Scranton	11W	Slight	Moderate	Slight	Slight	Severe	Slash pine	84	11	Loblolly pine, slash pine.
							Longleaf pine	70	6	
							Loblolly pine	80	8	
							Sweetgum	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
21 Goldhead	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine	80	10	Slash pine, loblolly pine, longleaf pine.
							Loblolly pine	90	9	
							Longleaf pine	65	5	
							Baldcypress	---	---	
							Blackgum	---	---	
							Cabbage palm	---	---	
							Laurel oak	---	---	
							Sweetgum	---	---	
							Water oak	---	---	
22 Pelham	11W	Slight	Severe	Severe	Slight	Moderate	Slash pine	90	11	Slash pine, loblolly pine.
							Loblolly pine	90	9	
							Longleaf pine	80	7	
							Sweetgum	80	6	
							Blackgum	80	8	
							Water oak	80	5	
25 Maurepas	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress	75	2	**
							Baldcypress	---	---	
							Blackgum	---	---	
							Carolina ash	---	---	
							Red maple	---	---	
							Sweetbay	---	---	
27 Pamlico	2W	Slight	Severe	Severe	Moderate	Severe	Pond cypress	75	2	**
							Pond pine	---	---	
							Baldcypress	---	---	
							Water tupelo	---	---	
							Blackgum	---	---	
							Red maple	---	---	
28 Santee	8W	Slight	Severe	Severe	Slight	Severe	Sweetgum	95	8	**
							Water tupelo	---	---	
							Willow oak	---	---	
							Cypress	---	---	
							Swamp maple	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
29:										
Rutlege	7W	Slight	Severe	Severe	Slight	Severe	Baldcypress	108	7	**
							Sweetgum	90	7	
							Laurel oak	---	---	
							Sweetbay	---	---	
Osier	7W	Slight	Severe	Severe	Slight	Severe	Baldcypress	108	7	**
							Slash pine	85	11	
							Loblolly pine	87	9	
							Longleaf pine	69	5	
							Red maple	---	---	
							Water oak	---	---	
							Sweetgum	---	---	
31 Pottsburg	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine	70	8	Slash pine, loblolly pine, longleaf pine.
							Longleaf pine	60	4	
							Loblolly pine	70	6	
							Live oak	---	---	
							Water oak	---	---	
32 Blanton	11S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	85	11	Slash pine, loblolly pine, longleaf pine.
							Loblolly pine	85	8	
							Longleaf pine	75	6	
							Live oak	---	---	
							Bluejack oak	---	---	
							Turkey oak	---	---	
34 Penney	8S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	70	8	Sand pine, slash pine, longleaf pine.
							Longleaf pine	60	4	
							Sand pine	75	4	
							Turkey oak	---	---	
							Bluejack oak	---	---	
							Post oak	---	---	
							Live oak	---	---	
36 Ortega	10S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, loblolly pine, longleaf pine.
							Longleaf pine	70	6	
							Loblolly pine	80	8	
							Blackjack oak	---	---	
							Post oak	---	---	
							Turkey oak	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
37 Ridgewood	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, longleaf pine.
							Longleaf pine	65	5	
							Laurel oak	---	---	
							Live oak	---	---	
							Water oak	---	---	
							Southern red oak	---	---	
38 Surrency	11W	Slight	Severe	Severe	Slight	Severe	Slash pine	90	11	**
							Loblolly pine	95	9	
							Sweetgum	90	7	
							Blackgum	---	---	
							Water oak	---	---	
							Baldcypress	---	---	
							Water tupelo	---	---	
39 Meadowbrook	10W	Slight	Severe	Severe	Slight	Severe	Slash pine	88	10	**
							Loblolly pine	91	9	
							Blackgum	---	---	
							Laurel oak	---	---	
							Red maple	---	---	
							Sweetgum	---	---	
							Water oak	---	---	
40 Ousley	10S	Slight	Moderate	Moderate	Slight	Moderate	Loblolly pine	80	10	Slash pine, loblolly pine.
							Slash pine	80	8	
							Longleaf pine	80	7	
							Water oak	---	---	
							Laurel oak	---	---	
							Live oak	---	---	
41 Albany	11W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	85	11	Loblolly pine, slash pine.
							Loblolly pine	95	9	
							Longleaf pine	80	7	
							Water oak	---	---	
							Live oak	---	---	
							Laurel oak	---	---	
42 Osier	11W	Slight	Severe	Severe	Slight	Severe	Slash pine	85	11	Slash pine, loblolly pine.
							Loblolly pine	87	9	
							Longleaf pine	69	5	
							Sweetgum	---	---	
							Water oak	---	---	
							Laurel oak	---	---	
							Red maple	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
43 Pamlico	7W	Slight	Severe	Severe	Moderate	Severe	Baldcypress	---	---	**
							Pond pine	108	7	
							Blackgum	---	---	
							Red maple	---	---	
							Sweetbay	---	---	
46 Plummer	2W	Slight	Severe	Severe	Slight	Severe	Pond cypress	75	2	**
							Baldcypress	---	---	
							Pond pine	60	---	
							Swamp tupelo	---	---	
							Blackgum	---	---	
47 Newnan	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, loblolly pine, longleaf pine.
							Longleaf pine	65	5	
							Loblolly pine	80	8	
							Water oak	---	---	
49:										
Sapelo	10W	Slight	Moderate	Moderate	Slight	Severe	Loblolly pine	77	10	Loblolly pine, slash pine.
							Slash pine	77	7	
							Longleaf pine	65	5	
Meadowbrook	10W	Slight	Severe	Severe	Slight	Severe	Slash pine	88	10	**
							Loblolly pine	91	9	
							Blackgum	---	---	
							Laurel oak	---	---	
							Red maple	---	---	
							Sweetgum	---	---	
							Water oak	---	---	
50 Leon	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine	70	8	**
							Longleaf pine	65	5	
51 Pottsburg	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine	70	8	Slash pine, loblolly pine, longleaf pine.
							Longleaf pine	60	4	
							Loblolly pine	70	6	
							Live oak	---	---	
							Water oak	---	---	
52 Meggett	13W	Slight	Severe	Severe	Severe	Severe	Slash pine	100	13	**
							Loblolly pine	100	11	
							Pond pine	75	---	
							Red maple	---	---	
							Water oak	---	---	
							Sweetgum	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Crdination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
54---------- Troup	8S	Slight	Moderate	Moderate	Slight	Moderate	Loblolly pine--------	82	8	Loblolly pine, slash pine, longleaf pine.
							Longleaf pine--------	74	6	
							Turkey oak----------	---	---	
							Post oak----------	---	---	
56---------- Kershaw	8S	Slight	Moderate	Severe	Slight	Slight	Slash pine----------	65	8	Sand pine, slash pine, longleaf pine.
							Longleaf pine--------	55	3	
							Turkey oak----------	---	---	
							Bluejack oak---------	---	---	
							Post oak----------	---	---	
58---------- Allanton	10W	Slight	Severe	Severe	Slight	Moderate	Slash pine----------	80	10	**
							Longleaf pine--------	70	6	
							Sweetgum----------	90	7	
							Sweetbay----------	---	---	
							Blackgum----------	---	---	
							Red maple----------	---	---	
59---------- Lynn Haven	11W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	90	11	Slash pine, loblolly pine.
							Loblolly pine--------	80	8	
							Longleaf pine--------	70	6	
							Pond pine----------	70	---	
60---------- Ridgeland	10W	Slight	Moderate	Moderate	Slight	Moderate	Loblolly pine--------	80	10	Slash pine, longleaf pine.
							Slash pine----------	80	8	
							Longleaf pine--------	70	6	
							Post oak----------	---	---	
							Live oak----------	---	---	
							Water oak----------	---	---	
61---------- Wesconnett	11W	Slight	Severe	Severe	Slight	Severe	Slash pine----------	90	11	Slash pine.
							Longleaf pine--------	80	7	
							Sweetgum----------	---	---	
							Baldcypress---------	---	---	
							Water oak----------	---	---	
							Red maple----------	---	---	
62---------- Neilhurst	8S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	70	8	Longleaf pine, slash pine, sand pine.
							Longleaf pine--------	60	4	
63---------- Solite	8W	Slight	Severe	Severe	Slight	Slight	Slash pine----------	70	8	Slash pine, longleaf pine, loblolly pine.
							Longleaf pine--------	65	5	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
64---------- Ona	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slash pine.
							Longleaf pine-------	70	6	
							Water oak----------	---	---	
							Blackgum----------	---	---	
65---------- Meadowbrook	10W	Slight	Severe	Severe	Slight	Severe	Slash pine----------	88	10	Loblolly pine, slash pine, longleaf pine.
							Loblolly pine-------	91	9	
							Longleaf pine-------	70	6	
							Live oak----------	---	---	
							Water oak----------	---	---	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** Trees to plant are not given for this soil because of equipment limitations and other management concerns. Natural vegetation is preferred.

TABLE 7.--GRAZEABLE WOODLAND POTENTIALS

Map symbol and soil name	Site	Important native plants for grazing	Annual forage production in excellent condition
			Lbs/ac of air-dry wt. herbage
1 Albany 9 Leon 59 Lynn Haven 4 Ocilla 64 Ona 22 Pelham 17 Plummer 31 Pottsburg 8 Sapelo	North Florida Flatwoods	Creeping bluestem Chalky bluestem Blue maidencane Indiangrass	5,000
2, 32 Blanton 7 Centenary 3 Hurricane 56 Kershaw 10, 36 Ortega 5, 34 Penney 8, 37 Ridgewood 54 Troup	Longleaf Pine-Turkey Oak Hills	Creeping bluestem Indiangrass Purple bluestem Greenbrier	3,500

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1 Albany	Severe: wetness.	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.	Severe: droughty.
2 Blanton	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
3 Hurricane	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
4 Ocilla	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, droughty.
5 Penney	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
6 Mandarin	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty.
7 Centenary	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
8 Sapelo	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: droughty, wetness.
9 Leon	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
10 Ortega	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
11:					
Allanton	Severe: ponding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, ponding.	Severe: too sandy, wetness, ponding.	Severe: ponding.
Rutlege	Severe: ponding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, ponding.	Severe: too sandy, wetness, ponding.	Severe: ponding.
12 Surrency	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
13 Meggett	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
14:					
Ortega	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Urban land.					

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
15. Quartzipsamments					
16:					
Hurricane	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Urban land.					
17 Plummer	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
18 Ridgewood	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
19 Osier	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
20 Scranton	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
21 Goldhead	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
22 Pelham	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
23:					
Sapelo	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: droughty, wetness.
Urban land.					
24. Urban land					
25 Maurepas	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
27 Pamlico	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
28 Santee	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
29:					
Rutlege	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Osier	Severe: wetness, too sandy, flooding.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding.
30 Arents	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
31 Pottsburg	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
32 Blanton	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
34 Penney	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
36 Ortega	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
37 Ridgewood	Severe: too sandy.	Severe: too sandy.	Severe: too sandy, slope.	Severe: too sandy.	Moderate: droughty.
38 Surrency	Severe: flooding, too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, flooding.	Severe: wetness, too sandy.	Severe: flooding, wetness.
39 Meadowbrook	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: flooding, wetness, droughty.
40 Ousley	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
41 Albany	Severe: flooding, wetness.	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.	Severe: droughty.
42 Osier	Severe: wetness, too sandy, flooding.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
43 Pamlico	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
46 Plummer	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding, droughty.
47 Newnan	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
49:					
Sapelo	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: droughty, wetness.
Meadowbrook	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: flooding, wetness, droughty.
50 Leon	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
51 Pottsburg	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
52 Meggett	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
54 Troup	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
56 Kershaw	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
58 Allanton	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding, droughty.
59 Lynn Haven	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
60 Ridgeland	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
61 Wesconnett	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding.
62 Neilhurst	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
63 Solite	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
64---------- Ona	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
65---------- Meadowbrook	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.

TABLE 9.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
1 Albany	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Poor.
2 Blanton	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
3 Hurricane	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
4 Ocilla	Fair	Fair	Good	Fair	Good	Fair	Fair	Fair	Good	Fair.
5 Penney	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
6 Mandarin	Very poor.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.
7 Centenary	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
8 Sapelo	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
9 Leon	Poor	Fair	Good	Poor	Fair	Fair	Poor	Fair	Fair	Poor.
10 Ortega	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
11:										
Allanton	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Rutlege	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
12 Surrency	Poor	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair.
13 Meggett	Poor	Fair	Good	Fair	Good	Good	Good	Fair	Good	Good.
14:										
Ortega	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Urban land.										
15. Quartzipsamments										
16:										
Hurricane	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
Urban land.										

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
17 Plummer	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
18 Ridgewood	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.
19 Osier	Very poor.	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Fair.
20 Scranton	Fair	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Poor.
21 Goldhead	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Poor.
22 Pelham	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
23:										
Sapelo	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
Urban land.										
24. Urban land										
25 Maurepas	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Very poor.	Fair.
27 Pamlico	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
28 Santee	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
29:										
Rutlege	Very poor.	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair.
Osier	Very poor.	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Fair.
30 Arents	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Poor	Very poor.
31 Pottsburg	Poor	Poor	Fair	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
32 Blanton	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
34 Penney	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
36 Ortega	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
37 Ridgewood	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.
38 Surrency	Poor	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair.

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
39 Meadowbrook	Very poor.	Very poor.	Poor	Fair	Poor	Good	Fair	Very poor.	Poor	Fair.
40 Ousley	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
41 Albany	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Poor.
42 Osier	Very poor.	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Fair.
43 Pamlico	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
46 Plummer	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
47 Newnan	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
49:										
Sapelo	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
Meadowbrook	Very poor.	Very poor.	Poor	Fair	Poor	Good	Fair	Very poor.	Poor	Fair.
50 Leon	Poor	Fair	Good	Poor	Fair	Fair	Poor	Fair	Fair	Poor.
51 Pottsburg	Poor	Poor	Fair	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
52 Meggett	Poor	Fair	Fair	Fair	Good	Good	Good	Fair	Good	Good.
54 Troup	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
56 Kershaw	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
58 Allanton	Poor	Poor	Poor	Fair	Fair	Good	Good	Poor	Fair	Good.
59 Lynn Haven	Poor	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Poor	Fair.
60 Ridgeland	Poor	Poor	Poor	Fair	Fair	Poor	Poor	Poor	Fair	Poor.
61 Wesconnett	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
62 Neilhurst	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
63 Solite	Poor	Poor	Poor	Poor	Poor	Fair	Poor	Poor	Poor	Fair.

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
64---------- Ona	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
65---------- Meadowbrook	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair.

TABLE 10.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
1 Albany	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Severe: droughty.
2 Blanton	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
3 Hurricane	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
4 Ocilla	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
5 Penney	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
6 Mandarin	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
7 Centenary	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
8 Sapelo	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: droughty, wetness.
9 Leon	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
10 Ortega	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
11:						
Allanton	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Rutlege	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
12 Surrency	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
13 Meggett	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, wetness.	Severe: wetness.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
14:						
Ortega	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
Urban land.						
15. Quartzipsamments						
16:						
Hurricane	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
Urban land.						
17 Plummer	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
18 Ridgewood	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty.
19 Osier	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
20 Scranton	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
21 Goldhead	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
22 Pelham	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
23:						
Sapelo	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: droughty, wetness.
Urban land.						
24. Urban land						
25 Maurepas	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: ponding, flooding, excess humus.
27 Pamlico	Severe: cutbanks cave, excess humus, ponding.	Severe: wetness, low strength.	Severe: wetness.	Severe: wetness, low strength.	Severe: wetness.	Severe: wetness, excess humus.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
28---------- Santee	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.
29:						
Rutlege----------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, droughty, flooding.
Osier----------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.
30---------- Arents	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
31---------- Pottsburg	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
32---------- Blanton	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Moderate: slope.	Slight---------	Severe: droughty.
34---------- Penney	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: droughty.
36---------- Ortega	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Moderate: slope.	Slight---------	Severe: droughty.
37---------- Ridgewood	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness.	Moderate: droughty.
38---------- Surrency	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.
39---------- Meadowbrook	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness, droughty.
40---------- Ousley	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: droughty.
41---------- Albany	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: droughty.
42---------- Osier	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.
43---------- Pamlico	Severe: cutbanks cave, excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, flooding, ponding.	Severe: ponding, flooding, excess humus.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
46---------- Plummer	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, droughty.
47---------- Newnan	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
49:						
Sapelo----------	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: droughty, wetness.
Meadowbrook------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness, droughty.
50---------- Leon	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
51---------- Pottsburg	Severe: wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, droughty.
52---------- Meggett	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, wetness, flooding.	Severe: wetness, flooding.
54---------- Troup	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
56---------- Kershaw	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: droughty.
58---------- Allanton	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding, droughty.
59---------- Lynn Haven	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
60---------- Ridgeland	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty.
61---------- Wesconnett	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: ponding, wetness.	Severe: wetness, flooding.
62---------- Neilhurst	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: droughty.
63---------- Solite	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
64---------- Ona	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
65---------- Meadowbrook	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1 Albany	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, wetness.
2 Blanton	Moderate: wetness.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: too sandy.
3 Hurricane	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, seepage, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
4 Ocilla	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
5* Penney	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
6 Mandarin	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: wetness, seepage.	Poor: seepage, too sandy.
7* Centenary	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
8 Sapelo	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
9 Leon	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
10* Ortega	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
11:					
Allanton	Severe: ponding.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: ponding, seepage.	Poor: seepage, too sandy, ponding.
Rutlege	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: too sandy, ponding.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
12---------- Surrency	Severe: ponding.	Severe: seepage, ponding.	Severe: ponding, too sandy.	Severe: seepage, ponding.	Poor: too sandy, ponding.
13---------- Meggett	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
14*:					
Ortega----------	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Urban land.					
15. Quartzipsamments					
16:					
Hurricane----------	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, seepage, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
Urban land.					
17---------- Plummer	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
18---------- Ridgewood	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, seepage.
19---------- Osier	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
20---------- Scranton	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
21---------- Goldhead	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
22---------- Pelham	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: wetness, seepage.	Poor: wetness.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
23:					
Sapelo	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Urban land.					
24. Urban land					
25 Maurepas	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Severe: ponding, excess humus.
27 Pamlico	Severe: ponding, poor filter.	Severe: seepage, excess humus, wetness.	Severe: seepage, ponding, too sandy.	Severe: seepage, wetness.	Poor: seepage, excess humus, wetness.
28 Santee	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
29:					
Rutlege	Severe: ponding, poor filter.	Severe: seepage, flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: seepage, flooding, wetness.	Poor: seepage, too sandy, wetness.
Osier	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, seepage.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
30 Arents	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
31 Pottsburg	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: wetness, seepage.	Poor: too sandy, wetness, seepage.
32 Blanton	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: too sandy.	Severe: seepage.	Poor: too sandy.
34* Penney	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
36* Ortega	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
37---------- Ridgewood	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, seepage.
38---------- Surrency	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, too sandy.	Severe: flooding, seepage, wetness.	Poor: too sandy, wetness.
39---------- Meadowbrook	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, too sandy.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
40---------- Ousley	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy.
41---------- Albany	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, too sandy.	Severe: flooding, seepage, wetness.	Poor: too sandy, wetness.
42---------- Osier	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, seepage.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
43---------- Pamlico	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, excess humus, ponding.
46---------- Plummer	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
47---------- Newnan	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
49:					
Sapelo----------	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Meadowbrook--------	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, too sandy.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
50---------- Leon	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
51---------- Pottsburg	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, too sandy.	Severe: flooding, seepage, wetness.	Poor: too sandy, wetness, seepage.
52---------- Meggett	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
54---------- Troup	Slight----------	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
56*---------- Kershaw	Slight----------	Severe: seepage.	Severe: too sandy, seepage.	Severe: seepage.	Poor: seepage, too sandy.
58---------- Allanton	Severe: flooding, wetness.	Severe: seepage, wetness, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
59---------- Lynn Haven	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
60---------- Ridgeland	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
61---------- Wesconnett	Severe: flooding, wetness, poor filter.	Severe: seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
62*---------- Neilhurst	Slight----------	Severe: seepage.	Severe: too sandy, seepage.	Severe: seepage.	Poor: seepage, too sandy.
63---------- Solite	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
64---------- Ona	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
65---------- Meadowbrook	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.

* Because of poor filtration, ground water contamination may be a hazard in areas that have a concentration of septic tank absorption fields.

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1 Albany	Fair: wetness.	Improbable: thin layer.	Improbable: excess fines.	Poor: too sandy.
2 Blanton	Good	Probable	Improbable: too sandy.	Poor: too sandy.
3 Hurricane	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
4 Ocilla	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
5 Penney	Good	Probable	Improbable: too sandy.	Poor: too sandy.
6 Mandarin	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
7 Centenary	Good	Probable	Improbable: too sandy.	Poor: too sandy.
8 Sapelo	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: too sandy, wetness.
9 Leon	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
10 Ortega	Good	Probable	Improbable: too sandy.	Poor: too sandy.
11:				
Allanton	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Rutlege	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: too sandy, wetness.
12 Surrency	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
13 Meggett	Poor: wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
14:				
Ortega	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Urban land.				
15. Quartzipsamments				

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
16:				
Hurricane	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
Urban land.				
17 Plummer	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
18 Ridgewood	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
19 Osier	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
20 Scranton	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
21 Goldhead	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
22 Pelham	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
23:				
Sapelo	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: too sandy, wetness.
Urban land.				
24. Urban land				
25 Maurepas	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
27 Pamlico	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
28 Santee	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
29:				
Rutlege	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
Osier	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
30 Arents	Poor: thin layer.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
31 Pottsburg	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
32 Blanton	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
34 Penney	Good	Probable	Improbable: too sandy.	Poor: too sandy.
36 Ortega	Good	Probable	Improbable: too sandy.	Poor: too sandy.
37 Ridgewood	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
38 Surrency	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
39 Meadowbrook	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
40 Ousley	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
41 Albany	Fair: wetness.	Improbable: thin layer.	Improbable: excess fines.	Poor: too sandy.
42 Osier	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
43 Pamlico	Poor: low strength, wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
46 Plummer	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
47 Newnan	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
49:				
Sapelo	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: too sandy, wetness.
Meadowbrook	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
50 Leon	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
51 Pottsburg	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
52 Meggett	Poor: wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
54 Troup	Good	Probable	Improbable: too sandy.	Poor: too sandy.
56 Kershaw	Good	Probable	Improbable: too sandy.	Poor: too sandy.
58 Allanton	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
59 Lynn Haven	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
60 Ridgeland	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
61 Wesconnett	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
62 Neilhurst	Good	Probable	Improbable: too sandy.	Poor: too sandy.
63 Solite	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
64 Ona	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
65 Meadowbrook	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.

TABLE 13.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Map symbol and soil name	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.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
2---------- Blanton	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
3---------- Hurricane	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
4---------- Ocilla	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Favorable------	Wetness, droughty, fast intake.	Wetness--------	Droughty.
5---------- Penney	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
6---------- Mandarin	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Too sandy, soil blowing, wetness.	Droughty.
7---------- Centenary	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
8---------- Sapelo	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Droughty, wetness.
9---------- Leon	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
10---------- Ortega	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
11:							
Allanton	Severe: seepage.	Severe: seepage, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.
Rutlege	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty.	Too sandy, ponding.	Wetness, droughty.
12 Surrency	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty.	Ponding, too sandy.	Wetness, droughty.
13 Meggett	Moderate: seepage.	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
14:							
Ortega	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Urban land.							
15. Quartzipsamments							
16:							
Hurricane	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
Urban land.							
17 Plummer	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
18 Ridgewood	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
19 Osier	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
20---------- Scranton	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
21---------- Goldhead	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
22---------- Pelham	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Favorable------	Fast intake, wetness.	Wetness, soil blowing.	Wetness.
23:							
Sapelo----------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Droughty, wetness.
Urban land.							
24. Urban land							
25---------- Maurepas	Severe: seepage.	Severe: excess humus, ponding.	Slight---------	Ponding, flooding, subsides.	Ponding, flooding.	Ponding--------	Wetness.
27---------- Pamlico	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Subsides, cutbanks cave.	Wetness, rooting depth.	Wetness, too sandy.	Wetness. rooting depth.
28---------- Santee	Slight---------	Severe: ponding.	Severe: slow refill.	Flooding, percs slowly, ponding.	Ponding, soil blowing, percs slowly.	Ponding, soil blowing, percs slowly.	Wetness, percs slowly.
29:							
Rutlege----------	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
Osier----------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
30---------- Arents	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Subsides, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
31---------- Pottsburg	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
32---------- Blanton	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Slope, cutbanks cave.	Slope, wetness, droughty.	Wetness, too sandy.	Droughty.
34---------- Penney	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
36---------- Ortega	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
37---------- Ridgewood	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Slope, cutbanks cave.	Slope, wetness, droughty.	Wetness, too sandy, soil blowing.	Droughty.
38---------- Surrency	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Droughty, fast intake.	Ponding, too sandy.	Wetness, droughty, rooting depth.
39---------- Meadowbrook	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
40---------- Ousley	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
41---------- Albany	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
42---------- Osier	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
43 Pamlico	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, subsides.	Ponding, flooding.	Ponding, too sandy.	Wetness.
46 Plummer	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy.	Wetness, droughty.
47 Newnan	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Slope, cutbanks cave.	Slope, wetness, droughty.	Wetness, too sandy, soil blowing.	Droughty.
49:							
Sapelo	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Droughty, wetness.
Meadowbrook	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
50 Leon	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
51 Pottsburg	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
52 Meggett	Moderate: seepage.	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
54 Troup	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy	Droughty.
56 Kershaw	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Too sandy, soil blowing.	Droughty.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
58---------- Allanton	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
59---------- Lynn Haven	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
60---------- Ridgeland	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
61---------- Wesconnett	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Wetness, flooding, cutbanks cave.	Wetness, fast intake, soil blowing.	Wetness, too sandy.	Wetness.
62---------- Neilhurst	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy------	Droughty.
63---------- Solite	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
64---------- Ona	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
65---------- Meadowbrook	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Li- quid limit	Plas- tic- ity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1---------- Albany	0-47	Fine sand, sand.	SM, SP-SM	A-2	0	100	100	75-100	10-20	---	NP
	47-60	Sandy loam, fine sandy loam.	SM	A-2	0	100	100	75-100	22-30	---	NP
	60-80	Sandy clay loam, sandy loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	97-100	95-100	70-100	20-50	<40	NP-17
2---------- Blanton	0-58	Fine sand, sand.	SP-SM, SM	A-3, A-2-4	0	100	90-100	65-100	5-20	---	NP
	58-80	Sandy clay loam, sandy loam.	SC, SM-SC, SM	A-4, A-2-4, A-2-6	0	100	95-100	69-100	25-32	12-45	3-22
3---------- Hurricane	0-56	Fine sand--------	SP, SP-SM	A-3	0	100	100	78-100	4-8	---	NP
	56-80	Sand, fine sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	4-15	---	NP
4---------- Ocilla	0-27	Loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	95-100	75-100	8-35	---	NP
	27-80	Sandy loam, sandy clay loam, fine sandy loam, clay loam.	SM, CL, SC, ML	A-2, A-4, A-6	0	100	95-100	80-100	20-55	20-40	NP-18
5---------- Penney	0-3	Fine sand--------	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	3-57	Sand, fine sand.	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	57-80	Sand, fine sand.	SP-SM	A-3, A-2-4	0	100	95-100	75-100	5-12	---	NP
6---------- Mandarin	0-28	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-100	2-10	---	NP
	28-38	Fine sand, sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-15	---	NP
	38-60	Fine sand, sand.	SP, SP-SM	A-3	0	100	100	90-100	2-7	---	NP
	60-80	Fine sand, sand, loamy fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	90-100	3-12	---	NP
7---------- Centenary	0-5	Fine sand--------	SP, SP-SM	A-3	0	100	100	60-100	4-10	---	NP
	5-54	Sand, fine sand.	SP-SM, SP	A-3	0	100	100	65-100	4-20	---	NP
	54-80	Sand, fine sand.	SP, SP-SM	A-3	0	100	100	60-100	3-20	---	NP
8---------- Sapelo	0-16	Fine sand--------	SM, SP, SP-SM	A-2, A-3	0	100	100	85-100	4-20	---	NP
	16-29	Fine sand, sand.	SM, SP-SM	A-2, A-3	0	100	100	80-100	8-20	---	NP
	29-49	Fine sand, sand.	SM, SP, SP-SM	A-2, A-3	0	100	100	75-100	4-20	---	NP
	49-80	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	100	80-100	20-50	<40	NP-20
9---------- Leon	0-16	Fine sand--------	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	16-26	Sand, fine sand.	SM, SP-SM,	A-3, A-2-4	0	100	100	80-100	3-20	---	NP
	26-54	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-13	---	NP
	54-80	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
10---------- Ortega	0-3	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-100	3-8	---	NP
	3-80	Fine sand, sand.	SP, SP-SM	A-3	0	100	100	90-100	2-7	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
11:											
Allanton--------	0-18	Mucky fine sand, fine sand.	SP-SM	A-3, A-2-4	0	100	100	65-100	5-12	---	NP
	18-56	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	65-100	2-12	---	NP
	56-80	Sand, fine sand.	SP-SM	A-3, A-2-4	0	100	100	65-100	5-12	---	NP
Rutlege---------	0-23	Mucky fine sand, sand.	SM, SP-SM	A-2, A-3	0	95-100	95-100	50-80	5-35	---	NP
	23-80	Sand, fine sand.	SP, SP-SM	A-3	0	100	100	90-100	2-7	---	NP
12---------- Surrency	0-34	Fine sand, sand.	SM	A-2	0	100	95-100	50-75	10-26	---	NP
	34-80	Sandy loam, sandy clay loam.	SM, SC	A-2	0	100	95-100	80-98	30-48	<34	NP-10
13---------- Meggett	0-11	Fine sandy loam, loamy sand.	SM	A-2, A-4	0	100	90-100	85-100	13-41	---	NP
	11-23	Clay, sandy clay, clay loam.	CH, MH, CL	A-6, A-7	0	100	90-100	85-100	51-90	30-65	12-30
	23-46	Sandy clay, clay.	CL, SC, SM, ML	A-4, A-6,	0	90-100	65-100	50-100	40-90	<40	NP-25
	46-80	Stratified sand to clay.	---	---	---	---	---	---	---	---	---
14:											
Ortega----------	0-3	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-100	3-8	---	NP
	3-80	Fine sand, sand.	SP, SP-SM	A-3	0	100	100	90-100	2-7	---	NP
Urban land.											
15. Quartzipsamments											
16:											
Hurricane-------	0-56	Fine sand--------	SP, SP-SM	A-3	0	100	100	78-100	4-8	---	NP
	56-80	Sand, fine sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	4-15	---	NP
Urban land.											
17---------- Plummer	0-52	Sand, fine sand.	SM, SP-SM	A-2-4, A-3	0	100	100	75-100	5-20	---	NP
	52-80	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2-4, A-2-6, A-4	0	100	97-100	76-100	20-48	<30	NP-10
18---------- Ridgewood	0-5	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	5-80	Fine sand, sand.	SP-SM, SP	A-3, A-2-4	0	100	100	90-100	2-12	---	NP
19---------- Osier	0-5	Fine sand--------	SP-SM	A-2, A-3	0	100	98-100	60-100	5-12	---	NP
	5-80	Sand, fine sand.	SP, SP-SM	A-1, A-3, A-2-4	0	100	90-100	40-100	2-10	---	NP
20---------- Scranton	0-9	Fine sand--------	SP-SM, SM	A-2, A-3, A-1	0	100	95-100	40-100	5-20	---	NP
	9-80	Sand, fine sand.	SP-SM, SM, SP	A-2, A-3, A-1	0	100	95-100	40-100	1-15	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Li- quid limit	Plas- tic- ity index
	In				Pct					Pct	
21---------- Goldhead	0-6	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-99	2-6	---	NP
	6-38	Sand, fine sand	SP, SP-SM	A-3	0	100	100	90-99	2-6	---	NP
	38-51	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0-3	100	100	90-99	15-35	20-35	NP-25
	51-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	90-100	80-99	2-12	---	NP
22---------- Pelham	0-26	Fine sand, sand.	SM, SP-SM	A-2	0	100	95-100	75-100	10-25	---	NP
	26-64	Sandy clay loam, sandy loam, fine sandy loam, very fine sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	95-100	65-100	27-50	15-30	2-12
	64-80	Sandy clay loam, sandy clay.	SC, SM, ML, CL	A-2, A-4, A-6, A-7	0	100	95-100	65-100	27-65	20-45	3-20
23:											
Sapelo----------	0-19	Sand, fine sand.	SM, SP, SP-SM	A-2, A-3	0	100	100	85-100	4-20	---	NP
	19-32	Fine sand, sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	80-100	8-20	---	NP
	32-49	Fine sand, sand.	SM, SP, SP-SM	A-2, A-3	0	100	100	75-100	4-20	---	NP
	49-80	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	100	80-100	20-50	<40	NP-20
Urban land.											
24. Urban land											
25---------- Maurepas	0-66	Muck----------	PT	A-8	0	---	---	---	---	---	---
	66-75	Fine sand--------	SM, SP, SP-SM	A-2, A-3	0	100	100	85-100	8-20	---	NP
27---------- Pamlico	0-38	Muck----------	PT	---	0	---	---	---	---	---	---
	38-75	Sand, fine sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-20	---	NP
28---------- Santee	0-11	Fine sandy loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	80-95	30-50	<30	NP-10
	11-61	Sandy clay, sand, sandy loam, fine sandy loam, loam, clay loam, clay.	CL, CH	A-6, A-7	0	100	100	90-100	75-95	30-60	12-35
	61-80	Variable---------	---	---	---	---	---	---	---	---	---
29:											
Rutlege---------	0-12	Mucky fine sand.	SM, SP-SM	A-2, A-3	0	100	98-100	50-100	5-12	---	NP
	12-80	Sand, fine sand.	SP-SM	A-2, A-3	0	100	90-100	40-100	2-10	---	NP
Osier----------	0-6	Fine sand--------	SP-SM	A-2, A-3	0	100	98-100	60-100	5-12	---	NP
	6-80	Fine sand--------	Sp, SP-SM	A-3	0	100	98-100	60-100	5-18	---	NP
30---------- Arents	0-36	Fine sand--------	SP, SP-SM	A-3	0	100	100	80-90	2-10	---	NP
	36-80	Variable---------	---	---	---	---	---	---	---	---	---
31---------- Pottsburg	0-53	Sand, fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-18	---	NP
	53-80	Sand, fine sand.	SP-SM, SP, SM	A-3, A-2-4	0	100	100	90-100	4-18	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
32---------- Blanton	0-6	Fine sand--------	SP-SM, SM	A-3, A-2	0	96-100	90-100	65-100	5-20	---	NP
	6-58	Sand, fine sand.	SM, SP-SM	A-2, A-3	0	96-100	95-100	65-100	5-20	---	NP
	58-80	Sandy clay loam, sandy loam.	SC, SM-SC, SM	A-4, A-2, A-6, A-7	0	96-100	95-100	65-100	25-50	14-45	3-22
34---------- Penney	0-3	Fine sand--------	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	3-57	Sand, fine sand.	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	57-80	Sand, fine sand.	SP-SM	A-3, A-2-4	0	100	95-100	75-100	5-12	---	NP
36---------- Ortega	0-5	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-100	3-8	---	NP
	5-80	Fine sand, sand.	SP, SP-SM	A-3	0	100	100	90-100	2-7	---	NP
37---------- Ridgewood	0-4	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	4-80	Fine sand, sand.	SP-SM, SP	A-3, A-2-4	0	100	100	90-100	2-12	---	NP
38---------- Surrency	0-24	Fine sand, sand.	SM	A-2	0	100	95-100	50-98	10-26	---	NP
	24-80	Sandy clay loam, sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	95-100	80-98	30-44	<35	NP-15
39---------- Meadowbrook	0-43	Sand, fine sand.	SP, SP-SM	A-3	0	100	95-100	70-95	2-10	---	NP
	43-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC	A-2-4	0	100	95-100	70-99	13-35	<38	NP-20
40---------- Ousley	0-5	Fine sand--------	SP-SM, SM	A-3, A-2	0	100	100	80-100	5-25	---	NP
	5-80	Sand, fine sand.	SP-SM, SM, SP	A-3, A-2	0	100	100	80-100	2-15	---	NP
41---------- Albany	0-47	Fine sand, sand.	SM, SP-SM	A-2	0	100	100	75-100	10-20	---	NP
	47-60	Sandy loam, fine sandy loam.	SM	A-2	0	100	100	75-100	22-30	---	NP
	60-80	Sandy clay loam, sandy loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	97-100	95-100	70-100	20-50	<40	NP-17
42---------- Osier	0-5	Fine sand--------	SP-SM	A-2, A-3	0	100	98-100	60-100	5-12	---	NP
	5-80	Sand, fine sand.	SP, SP-SM	A-1, A-3, A-2-4	0	100	90-100	40-100	2-10	---	NP
43---------- Pamlico	0-38	Muck----------	PT	---	0	---	---	---	---	---	---
	38-80	Loamy sand, sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-20	---	NP
46---------- Plummer	0-46	Sand, fine sand, loamy sand.	SM, SP-SM	A-2-4, A-3	0	100	100	75-96	5-26	---	NP
	46-80	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2-4, A-4	0	100	97-100	76-96	20-48	<30	NP-10
47---------- Newnan	0-19	Fine sand--------	SP, SP-SM	A-3, A-2-4	0	100	98-100	80-100	3-12	---	NP
	19-29	Sand, fine sand.	SP-SM, SM	A-3, A-2-4	0	100	98-100	80-100	6-16	---	NP
	29-51	Sand, fine sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	98-100	80-100	3-18	---	NP
	51-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-4, A-6, A-2-6	0	100	98-100	85-100	18-40	<35	NP-20

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
49:											
Sapelo----------	0-18	Fine sand--------	SM, SP, SP-SM	A-2, A-3	0	100	100	85-100	4-20	---	NP
	18-34	Fine sand, sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	80-100	8-20	---	NP
	34-60	Fine sand, sand	SM, SP, SP-SM	A-2, A-3	0	100	100	75-100	4-20	---	NP
	60-80	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	100	80-100	20-50	<40	NP-20
Meadowbrook-----	0-7	Fine sand--------	SP, SP-SM	A-3	0	100	95-100	70-95	2-10	---	NP
	7-42	Sand, fine sand.	SP, SP-SM	A-3	0	100	95-100	70-95	2-10	---	NP
	42-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC	A-2-4,	0	100	95-100	70-99	13-35	<38	NP-10
50---------- Leon	0-16	Fine sand--------	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	16-26	Fine sand, sand.	SM, SP-SM SP	A-3, A-2-4	0	100	100	80-100	3-20	---	NP
	26-54	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-13	---	NP
	54-80	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
51---------- Pottsburg	0-65	Sand, fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-18	---	NP
	65-80	Sand, fine sand.	SP-SM, SP, SM	A-3, A-2-4	0	100	100	90-100	4-18	---	NP
52---------- Meggett	0-12	Fine sandy loam, loamy sand.	SM	A-2, A-4	0	100	90-100	85-100	13-41	---	NP
	12-23	Clay, sandy clay.	CH, MH, CL	A-6, A-7	0	100	90-100	85-100	51-90	30-60	12-30
	23-59	Clay, sandy clay.	CH, MH, CL	A-6, A-7	0	100	90-100	85-100	51-90	30-60	12-30
	59-80	Stratified sand to clay.	---	---	---	---	---	---	---	---	---
54---------- Troup	0-64	Sand, fine sand.	SM, SP-SM	A-2	0	95-100	90-100	50-100	10-30	---	NP
	64-80	Sandy clay loam, sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2, A-6	0	95-100	90-100	60-100	24-55	19-40	4-20
56---------- Kershaw	0-80	Sand----------	SP, SP-SM, SW	A-2, A-3	0	98-100	98-100	50-100	1-7	---	NP
58---------- Allanton	0-12	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	50-100	5-12	---	NP
	12-80	Sand, fine sand.	SP, SP-SM	A-3	0	100	100	65-100	1-10	---	NP
59---------- Lynn Haven	0-12	Fine sand--------	SP, SP-SM, SM	A-3, A-2-4	0	100	100	80-100	2-14	---	NP
	12-80	Sand, fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	70-100	5-20	---	NP
60---------- Ridgeland	0-8	Fine sand--------	SP-SM, SM	A-2, A-3	0	100	100	80-100	5-20	---	NP
	8-18	Sand, fine sand.	SP-SM, SP, SM	A-2, A-3	0	100	100	80-100	3-18	---	NP
	18-65	Sand, fine sand.	SP-SM, SP, SM	A-2, A-3	0	100	100	80-100	2-15	---	NP
	65-80	Sand, fine sand,	SP-SM, SP, SM	A-2, A-3	0	100	90-100	70-100	2-15	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Li- quid limit	Plas- tic- ity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
61---------- Wesconnett	0-12	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	12-51	Fine sand, sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-15	---	NP
	51-65	Fine sand, sand.	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	65-80	Fine sand, sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-15	---	NP
62---------- Neilhurst	0-80	Fine sand--------	SP, SP-SM	A-3, A-2-4	0	100	98-100	50-80	1-7	---	NP
63---------- Solite	0-80	Sand----------	SP, SP-SM	A-3, A-2-4	0	100	100	75-100	1-12	---	NP
64---------- Ona	0-5	Fine sand--------	SP-SM, SP	A-3	0	100	100	85-95	3-10	---	NP
	5-15	Fine sand, sand.	SP-SM, SM	A-3, A-2-4	0	100	100	85-95	5-20	---	NP
	15-41	Fine sand, sand.	SP-SM, SP	A-3	0	100	100	85-95	3-10	---	NP
	41-80	Fine sand, sand.	SP-SM, SP	A-3	0	100	100	85-95	3-10	---	NP
65---------- Meadowbrook	0-42	Sand, fine sand.	SP, SP-SM	A-3	0	100	95-100	70-95	2-10	---	NP
	42-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC	A-2-4	0	100	95-100	70-99	13-35	18-38	NP-10

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
1---------- Albany	0-47	1-10	1.40-1.55	6.0-20	0.02-0.04	3.6-6.5	Low----------	0.10	5	2	1-2
	47-60	1-20	1.50-1.70	2.0-6.0	0.08-0.10	3.6-6.0	Low----------	0.20			
	60-80	13-35	1.55-1.65	0.6-2.0	0.10-0.16	3.6-6.0	Low----------	0.24			
2---------- Blanton	0-58	1-7	1.30-1.60	6.0-20	0.03-0.07	4.5-6.0	Low----------	0.10	5	2	.5-1
	58-80	12-30	1.60-1.70	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.20			
3---------- Hurricane	0-56	1-4	1.40-1.60	>6.0	0.03-0.07	3.6-6.0	Low----------	0.10	5	2	0-2
	56-80	1-4	1.40-1.60	2.0-20	0.03-0.10	3.6-6.0	Low----------	0.10			
4---------- Ocilla	0-27	4-10	1.45-1.65	2.0-20	0.05-0.08	4.5-5.5	Low----------	0.10	5	2	1-2
	27-80	15-35	1.55-1.70	0.6-2.0	0.09-0.12	4.5-5.5	Low----------	0.24			
5---------- Penney	0-3	0-3	1.30-1.55	6.0-20	0.04-0.08	3.6-6.0	Low----------	0.10	5	2	0-2
	3-57	0-3	1.35-1.65	6.0-20	0.02-0.06	3.6-6.0	Low----------	0.10			
	57-80	2-6	1.50-1.65	6.0-20	0.05-0.08	3.6-6.0	Low----------	0.10			
6---------- Mandarin	0-28	0-3	1.35-1.45	6.0-20	0.03-0.07	3.6-6.0	Low----------	0.10	5	2	1-3
	28-38	2-9	1.45-1.60	0.6-2.0	0.10-0.15	3.6-6.0	Low----------	0.15			
	38-60	0-3	1.35-1.45	6.0-20	0.03-0.07	3.6-6.0	Low----------	0.10			
	60-80	2-9	1.45-1.60	0.6-2.0	0.10-0.15	3.6-6.0	Low----------	0.15			
7---------- Centenary	0-5	1-8	1.40-1.60	6.0-20	0.03-0.08	3.6-6.5	Low----------	0.10	5	1	0-1
	5-54	1-8	1.40-1.60	6.0-20	0.03-0.05	3.6-6.0	Low----------	0.10			
	54-80	2-10	1.50-1.70	2.0-6.0	0.03-0.10	3.6-6.0	Low----------	0.10			
8---------- Sapelo	0-16	2-5	1.40-1.65	6.0-20	0.03-0.07	3.6-5.5	Low----------	0.10	5	2	1-3
	16-29	3-7	1.35-1.60	0.6-2.0	0.10-0.15	3.6-5.5	Low----------	0.15			
	29-49	3-6	1.50-1.70	6.0-20	0.03-0.07	3.6-5.5	Low----------	0.17			
	49-80	10-30	1.55-1.75	0.6-2.0	0.12-0.17	3.6-5.5	Low----------	0.24			
9---------- Leon	0-16	1-6	1.40-1.65	6.0-20	0.02-0.05	3.6-5.5	Low----------	0.10	5	2	.5-4
	16-26	2-8	1.50-1.70	0.6-6.0	0.05-0.10	3.6-5.5	Low----------	0.15			
	26-54	1-6	1.40-1.65	0.6-6.0	0.02-0.05	3.6-5.5	Low----------	0.10			
	54-80	2-8	1.50-1.70	0.6-6.0	0.05-0.10	3.6-5.5	Low----------	0.15			
10---------- Ortega	0-3	1-3	1.20-1.45	6.0-20	0.05-0.08	3.6-6.5	Low----------	0.10	5	2	1-2
	3-80	1-3	1.35-1.60	6.0-20	0.03-0.06	3.6-6.5	Low----------	0.10			
11:											
Allanton--------	0-18	1-5	1.35-1.60	2.0-6.0	0.15-0.20	4.5-5.5	Low----------	0.10	5	2	10-20
	18-56	1-3	1.35-1.60	2.0-6.0	0.02-0.06	4.5-5.5	Low----------	0.10			
	56-80	1-5	1.40-1.55	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.10			
Rutlege---------	0-23	0-10	1.00-1.20	6.0-20	0.15-0.20	3.6-5.5	Low----------	0.17	5	2	10-20
	23-80	0-10	1.40-1.60	6.0-20	0.04-0.08	3.6-5.5	Low----------	0.10			
12---------- Surrency	0-34	0-10	1.50-1.70	2.0-20	0.05-0.10	3.6-5.0	Low----------	0.10	5	2	1-9
	34-80	23-35	1.60-1.85	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.15			
13---------- Meggett	0-11	5-20	1.10-1.30	2.0-6.0	0.10-0.15	4.5-6.5	Low----------	0.24	5	2	2-8
	11-80	40-60	1.50-1.75	0.06-0.2	0.13-0.18	5.6-8.4	High----------	0.32			
14:											
Ortega----------	0-3	1-3	1.20-1.45	6.0-20	0.05-0.08	3.6-6.5	Low----------	0.10	5	2	1-2
	3-80	1-3	1.35-1.60	6.0-20	0.03-0.06	3.6-6.5	Low----------	0.10			
Urban land.											

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
15. Quartzipsamments											
16:											
Hurricane	0-56	1-4	1.40-1.60	>6.0	0.03-0.07	3.6-6.0	Low	0.10	5	2	0-2
	56-80	1-4	1.40-1.60	2.0-20	0.03-0.10	3.6-6.0	Low	0.10			
Urban land.											
17 Plummer	0-52	1-7	1.35-1.65	2.0-20	0.03-0.07	3.6-5.5	Low	0.10	5	2	1-3
	52-80	15-30	1.50-1.70	0.6-2.0	0.07-0.15	3.6-5.5	Low	0.15			
18 Ridgewood	0-5	1-3	1.35-1.55	6.0-20	0.05-0.10	3.6-6.0	Low	0.10	5	2	0-1
	5-80	0-5	1.35-1.65	6.0-20	0.03-0.08	3.6-6.0	Low	0.10			
19 Osier	0-5	1-10	1.35-1.60	6.0-20	0.03-0.10	3.6-6.0	Low	0.10	5	2	2-5
	5-80	2-5	1.40-1.60	>20	0.02-0.05	3.6-6.0	Low	0.05			
20 Scranton	0-9	2-8	1.30-1.60	6.0-20	0.05-0.10	4.5-6.5	Low	0.10	5	2	1-4
	9-80	2-10	1.40-1.60	6.0-20	0.04-0.08	4.5-6.0	Low	0.10			
21 Goldhead	0-6	1-2	1.30-1.50	6.0-20	0.05-0.15	5.1-7.8	Low	0.10	5	2	1-4
	6-38	1-2	1.35-1.50	6.0-20	0.02-0.05	5.1-7.8	Low	0.10			
	38-51	13-28	1.45-1.65	0.6-2.0	0.10-0.20	6.1-8.4	Low	0.24			
	51-80	1-10	1.50-1.65	6.0-20	0.02-0.05	6.1-8.4	Low	0.10			
22 Pelham	0-26	1-8	1.50-1.70	6.0-20	0.04-0.07	3.6-5.5	Low	0.10	5	2	1-2
	26-64	15-30	1.30-1.60	0.6-2.0	0.10-0.13	3.6-5.5	Low	0.24			
	64-80	15-40	1.30-1.60	0.6-2.0	0.10-0.16	3.6-5.5	Low	0.24			
23:											
Sapelo	0-19	2-5	1.40-1.65	6.0-20	0.03-0.07	3.6-5.5	Low	0.10	5	2	1-3
	19-32	3-7	1.35-1.60	0.6-2.0	0.10-0.15	3.6-5.5	Low	0.15			
	32-49	3-6	1.50-1.70	6.0-20	0.03-0.07	3.6-5.5	Low	0.17			
	49-80	10-30	1.55-1.75	0.6-2.0	0.12-0.17	3.6-5.5	Low	0.24			
Urban land.											
24. Urban land											
25 Maurepas	0-66	---	0.05-0.25	>2.0	0.20-0.50	3.6-5.5	Low	----	---	---	20-80
	66-75	2-5	1.40-1.65	6.0-20	0.03-0.06	4.5-6.0	Low	0.10	---		
27 Pamlico	0-38	---	0.40-0.65	0.6-6.0	0.24-0.40	3.6-4.4	Low	----	---	---	20-80
	38-75	5-10	1.60-1.75	6.0-20	0.03-0.06	3.6-5.5	Low	0.10			
28 Santee	0-11	10-20	1.30-1.60	2.0-6.0	0.10-0.15	5.1-7.3	Low	0.24	4	3	2-8
	11-61	35-60	1.30-1.60	0.06-0.2	0.14-0.18	5.6-7.8	Moderate	0.32			
	61-80	10-20	1.40-1.65	0.06-0.2	0.10-0.15	5.6-7.8	Low	0.24			
29:											
Rutlege	0-23	0-10	1.30-1.50	6.0-20	0.04-0.10	3.6-5.0	Low	0.17	5	2	3-15
	23-80	0-10	1.30-1.50	6.0-20	0.04-0.08	3.6-5.0	Low	0.17			
Osier	0-5	1-10	1.35-1.60	6.0-20	0.03-0.10	3.6-6.0	Low	0.10	5	2	2-5
	5-80	2-5	1.40-1.60	>20	0.02-0.05	3.6-6.0	Low	0.05			
30 Arents	0-36	2-8	1.45-1.65	6.0-20	0.02-0.08	4.5-7.8	Low	0.17	5	2	0-3
	36-60	---	---	---	---	---	---	----			

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
31---------- Pottsburg	0-53	0-5	1.20-1.70	6.0-20	0.03-0.10	3.6-6.5	Low----------	0.10	5	2	1-3
	53-80	1-6	1.30-1.70	0.6-2.0	0.10-0.25	3.6-6.0	Low----------	0.15			
32---------- Blanton	0-47	1-7	1.40-1.65	6.0-20	0.03-0.07	4.5-6.0	Low----------	0.10	5	2	.5-2
	47-60	10-18	1.50-1.65	2.0-6.0	0.10-0.15	4.5-6.0	Low----------	0.15			
	60-80	12-30	1.60-1.70	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.20			
34---------- Penney	0-3	0-3	1.30-1.55	6.0-20	0.04-0.08	3.6-6.0	Low----------	0.10	5	2	0-2
	3-57	0-3	1.35-1.65	6.0-20	0.02-0.06	3.6-6.0	Low----------	0.10			
	57-80	2-6	1.50-1.65	6.0-20	0.05-0.08	3.6-6.0	Low----------	0.10			
36---------- Ortega	0-5	1-3	1.20-1.45	6.0-20	0.05-0.08	3.6-6.5	Low----------	0.10	5	2	1-2
	5-80	1-3	1.35-1.60	6.0-20	0.03-0.06	3.6-6.5	Low----------	0.10			
37---------- Ridgewood	0-4	1-3	1.35-1.55	6.0-20	0.05-0.10	3.6-6.0	Low----------	0.10	5	2	0-1
	4-80	0-5	1.35-1.65	6.0-20	0.03-0.08	3.6-6.0	Low----------	0.10			
38---------- Surrency	0-24	0-10	1.50-1.70	6.0-20	0.05-0.10	3.6-5.0	Low----------	0.10	5	2	1-10
	24-80	22-35	1.65-1.85	0.6-2.0	0.10-0.15	3.6-5.5	Low----------	0.15			
39---------- Meadowbrook	0-7	0-3	1.35-1.65	6.0-20	0.05-0.10	3.6-7.3	Low----------	0.10	5	2	1-3
	7-43	1-6	1.35-1.65	6.0-20	0.03-0.08	5.1-8.4	Low----------	0.10			
	43-70	9-20	1.50-1.80	0.2-0.6	0.10-0.15	5.1-8.4	Low----------	0.15			
	70-80	11-22	1.50-1.80	0.2-0.6	0.10-0.15	5.1-8.4	Low----------	0.15			
40---------- Ousley	0-5	1-3	1.35-1.45	6.0-20	0.05-0.10	4.5-5.5	Low----------	0.10	5	2	<.5
	5-80	1-2	1.45-1.60	6.0-20	0.02-0.06	4.5-5.5	Low----------	0.10			
41---------- Albany	0-47	1-10	1.40-1.55	6.0-20	0.02-0.04	3.6-6.5	Low----------	0.10	5	2	1-2
	47-60	1-20	1.50-1.70	2.0-6.0	0.08-0.10	4.5-6.0	Low----------	0.20			
	60-80	13-35	1.55-1.65	0.6-2.0	0.10-0.16	4.5-6.0	Low----------	0.24			
42---------- Osier	0-5	1-10	1.35-1.60	6.0-20	0.03-0.10	3.6-6.0	Low----------	0.10	5	2	2-5
	5-80	2-5	1.40-1.60	>20	0.02-0.05	3.6-6.0	Low----------	0.05			
43---------- Pamlico	0-38	---	0.20-0.65	0.6-6.0	0.24-0.40	3.6-5.5	Low----------	----	---	---	20-60
	38-80	5-10	1.60-1.75	6.0-20	0.03-0.06	3.6-5.5	Low----------	0.10			
46---------- Plummer	0-46	1-7	1.35-1.65	6.0-20	0.03-0.08	3.6-5.5	Low----------	0.10	5	2	1-10
	46-80	15-30	1.50-1.70	0.6-2.0	0.07-0.15	3.6-5.5	Low----------	0.15			
47---------- Newnan	0-19	0-5	1.45-1.55	6.0-20	0.03-0.10	3.6-6.0	Low----------	0.10	5	2	1-2
	19-29	2-8	1.40-1.55	2.0-20	0.07-0.15	3.6-6.0	Low----------	0.15			
	29-51	0-5	1.45-1.65	6.0-20	0.05-0.12	3.6-6.0	Low----------	0.10			
	51-80	12-30	1.65-1.80	0.06-0.6	0.07-0.15	3.6-6.0	Low----------	0.24			
49:											
Sapelo----------	0-18	2-5	1.40-1.65	6.0-20	0.03-0.07	3.6-5.5	Low----------	0.10	5	2	1-3
	18-34	3-7	1.35-1.60	0.6-2.0	0.10-0.15	3.6-5.5	Low----------	0.15			
	34-60	3-6	1.50-1.70	6.0-20	0.03-0.07	3.6-5.5	Low----------	0.17			
	60-80	10-30	1.55-1.75	0.6-2.0	0.12-0.17	3.6-5.5	Low----------	0.24			
Meadowbrook-----	0-7	0-3	1.35-1.65	6.0-20	0.05-0.10	3.6-7.3	Low----------	0.10	5	2	1-3
	7-42	1-6	1.35-1.65	6.0-20	0.03-0.08	5.1-8.4	Low----------	0.10			
	42-70	9-20	1.50-1.80	0.2-0.6	0.10-0.15	5.1-8.4	Low----------	0.15			
	70-80	11-22	1.50-1.80	0.2-0.6	0.10-0.15	5.1-8.4	Low----------	0.15			
50---------- Leon	0-16	1-6	1.40-1.65	6.0-20	0.02-0.05	3.6-5.5	Low----------	0.10	5	2	.5-4
	16-26	2-8	1.50-1.70	0.6-6.0	0.05-0.10	3.6-5.5	Low----------	0.15			
	26-54	1-6	1.40-1.65	0.6-6.0	0.02-0.05	3.6-5.5	Low----------	0.10			
	54-80	2-8	1.50-1.70	0.6-6.0	0.05-0.10	3.6-5.5	Low----------	0.15			

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
51---------- Pottsburg	0-65	0-5	1.20-1.70	6.0-20	0.03-0.10	3.6-6.5	Low----------	0.10	5	2	1-3
	65-80	1-6	1.30-1.70	0.6-2.0	0.10-0.25	3.6-6.0	Low----------	0.15			
52---------- Meggett	0-12	5-20	1.10-1.30	2.0-6.0	0.10-0.15	4.5-6.5	Low----------	0.24	5	---	2-8
	12-80	40-60	1.45-1.60	0.06-0.2	0.13-0.18	5.1-8.4	High----------	0.32			
54---------- Troup	0-64	1-10	1.30-1.70	6.0-20	0.05-0.10	4.5-6.0	Low----------	0.10	5	---	0-1
	64-80	15-35	1.40-1.60	0.6-2.0	0.10-0.13	4.5-5.5	Low----------	0.20			
56---------- Kershaw	0-80	0-5	1.35-1.60	>20	0.02-0.05	4.5-6.0	Low----------	0.10	5	1	0-1
58---------- Allanton	0-12	1-5	1.35-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.10	5	2	1-3
	12-56	1-3	1.35-1.60	2.0-6.0	0.04-0.08	4.5-5.5	Low----------	0.10			
	56-80	1-5	1.40-1.55	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.10			
59---------- Lynn Haven	0-26	1-4	1.35-1.60	6.0-20	0.05-0.10	3.6-5.5	Low----------	0.10	5	2	1-4
	26-80	2-8	1.40-1.55	0.6-6.0	0.10-0.20	3.6-5.5	Low----------	0.15			
60---------- Ridgeland	0-8	0-10	1.20-1.50	6.0-20	0.05-0.10	3.6-6.5	Low----------	0.10	5	1	1-4
	8-19	0-10	1.50-1.70	0.6-6.0	0.04-0.08	3.6-6.5	Low----------	0.15			
	19-65	0-10	1.40-1.60	6.0-20	0.04-0.08	3.6-6.5	Low----------	0.15			
	65-80	0-10	1.50-1.70	0.6-6.0	0.04-0.08	3.6-6.5	Low----------	0.15			
61---------- Wesconnett	0-12	1-7	1.10-1.40	6.0-20	0.10-0.15	3.6-6.5	Low----------	0.10	5	2	2-8
	12-51	3-8	1.30-1.55	0.6-6.0	0.10-0.15	3.6-6.5	Low----------	0.15			
	51-65	2-7	1.35-1.50	6.0-20	0.05-0.08	3.6-6.5	Low----------	0.10			
	65-80	2-8	1.40-1.65	0.6-6.0	0.10-0.15	3.6-6.5	Low----------	0.15			
62---------- Neilhurst	0-80	1-2	1.50-1.65	>20	0.02-0.05	4.5-6.0	Low----------	0.10	5	1	0-1
63---------- Solite	0-80	0-5	1.30-1.65	6.0-20	0.02-0.05	3.6-6.0	Low----------	0.10	5	2	1-5
64---------- Ona	0-5	1-7	1.40-1.55	6.0-20	0.10-0.15	3.6-6.0	Low----------	0.10	5	2	1-5
	5-15	3-8	1.50-1.65	0.6-2.0	0.10-0.15	3.6-6.0	Low----------	0.15			
	15-41	1-4	1.50-1.65	6.0-20	0.03-0.08	3.6-6.0	Low----------	0.10			
	41-80	3-8	1.50-1.65	0.6-2.0	0.10-0.15	3.6-6.0	Low----------	0.10			
65---------- Meadowbrook	0-7	0-3	1.35-1.65	6.0-20	0.05-0.10	3.6-7.3	Low----------	0.10	5	2	1-3
	7-42	1-6	1.35-1.65	6.0-20	0.03-0.08	5.1-8.4	Low----------	0.10			
	42-70	9-20	1.50-1.80	0.2-2.0	0.10-0.15	5.1-8.4	Low----------	0.15			
	70-80	11-22	1.50-1.80	0.2-2.0	0.10-0.15	5.1-8.4	Low----------	0.15			

TABLE 16.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydrologic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
1---------- Albany	C	None-------	---	---	1.0-2.5	Apparent	Dec-Mar	---	---	High----	High.
2---------- Blanton	A	None-------	---	---	5.0-6.0	Perched	Dec-Mar	---	---	High----	High.
3---------- Hurricane	C	None-------	---	---	2.0-3.5	Apparent	Jun-Sep	---	---	Low-----	Moderate.
4---------- Ocilla	C	None-------	---	---	1.0-2.5	Apparent	Dec-Apr	---	---	High----	Moderate.
5---------- Penney	A	None-------	---	---	>6.0	---	---	---	---	Low-----	High.
6---------- Mandarin	C	None-------	---	---	1.5-3.5	Apparent	Jun-Sep	---	---	Moderate	High.
7---------- Centenary	A	None-------	---	---	3.5-5.0	Apparent	Dec-Mar	---	---	Moderate	High.
8---------- Sapelo	D	None-------	---	---	0.5-1.5	Apparent	Jun-Sep	---	---	High----	High.
9---------- Leon	B/D	None-------	---	---	0-1.0	Apparent	Jun-Sep	---	---	High----	High.
10---------- Ortega	A	None-------	---	---	3.5-5.0	Apparent	Jun-Jan	---	---	Low-----	High.
11:											
Allanton*--------	D	None-------	---	---	+2-0	Apparent	Dec-May	---	---	High----	High.
Rutlege*--------	B/D	None-------	---	---	+2-0	Apparent	Dec-May	---	---	High----	High.
12---------- Surrency	D	None-------	---	---	+1-0	Apparent	Dec-Apr	---	---	High----	High.
13---------- Meggett	D	None-------	---	---	0-1.0	Apparent	Nov-Apr	---	---	High----	Moderate.
14:											
Ortega----------	A	None-------	---	---	3.5-5.0	Apparent	Jun-Jan	---	---	Low-----	High.
Urban land.											
15. Quartzipsamments											
16:											
Hurricane-------	C	None-------	---	---	2.0-3.5	Apparent	Jun-Sep	---	---	Low-----	Moderate.
Urban land.											
17---------- Plummer	B/D	None-------	---	---	0-1.5	Apparent	Jul-Mar	---	---	Moderate	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
18---------- Ridgewood	C	None-------	---	---	2.0-3.5	Apparent	Jun-Sep	---	---	Low-----	High.
19---------- Osier	B/D	None-------	---	---	0-1.0	Apparent	Jun-Sep	---	---	High----	High.
20---------- Scranton	B/D	None-------	---	---	0.5-1.5	Apparent	Jun-Sep	---	---	Low-----	High.
21---------- Goldhead	B/D	None-------	---	---	0-1.0	Apparent	Jul-Mar	---	---	High----	Moderate.
22---------- Pelham	B/D	None-------	---	---	0-1.0	Apparent	Jul-Mar	---	---	High----	High.
23:											
Sapelo----------	D	None-------	---	---	0.5-1.5	Apparent	Nov-Apr	---	---	High----	High.
Urban land.											
24. Urban land											
25*---------- Maurepas	D	Frequent---	Brief to very long.	Jan-Dec	+2-0	Apparent	Jan-Dec	15-30	>51	High----	Moderate.
27*---------- Pamlico	D	None-------	---	---	+2-0	Apparent	Jan-Dec	4-12	10-25	High----	High.
28*---------- Santee	D	Frequent---	Brief to long.	Nov-Apr	+1-1.0	Apparent	Jan-Dec	---	---	High----	Moderate.
29:											
Rutlege----------	B/D	Frequent---	Brief-----	Dec-May	0-1.0	Apparent	Jan-Dec	---	---	High----	High.
Osier----------	B/D	Frequent---	Brief-----	Dec-Apr	0-1.0	Apparent	Jan-Dec	---	---	High----	High.
30---------- Arents	B	None-------	---	---	2.0-4.0	Apparent	Jun-Jan	5-10	12-36	High----	High.
31---------- Pottsburg	B/D	None-------	---	---	0-1.0	Apparent	Jul-Mar	---	---	High----	High.
32---------- Blanton	B	None-------	---	---	2.5-4.0	Perched	Dec-Mar	---	---	High----	High.
34---------- Penney	A	None-------	---	---	>6.0	---	---	---	---	Low-----	High.
36---------- Ortega	A	None-------	---	---	3.5-5.0	Apparent	Jun-Jan	---	---	Low-----	High.
37---------- Ridgewood	C	Occasional-	---	---	2.0-3.5	Apparent	Jun-Sep	---	---	Low-----	High.
38---------- Surrency	D	Frequent---	Very long	Dec-Apr	0-0.5	Apparent	Dec-Apr	---	---	High----	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
39 Meadowbrook	B/D	Frequent	Brief to long.	---	0-1.0	Apparent	Jul-Mar	---	---	Moderate	High.
40 Ousley	C	Occasional	Very brief	---	1.5-3.0	Apparent	Dec-Apr	---	---	Low	High.
41 Albany	C	Occasional	Brief	Nov-Mar	1.0-2.5	Apparent	Dec-Mar	---	---	High	High.
42 Osier	B/D	Occasional	Brief	Dec-Apr	0-1.0	Apparent	Nov-Mar	---	---	High	High.
43* Pamlico	D	Frequent	Brief to long.	Jan-Dec	+1-0	Apparent	Jan-Dec	4-12	10-29	High	High.
46* Plummer	B/D	None	---	---	+2-0	Apparent	Dec-Jul	---	---	Moderate	High.
47 Newnan	C	None	---	---	1.5-2.5	Apparent	Aug-Feb	---	---	Low	High.
49:											
Sapelo	D	None	---	---	0.5-1.5	Apparent	Nov-Apr	---	---	High	High.
Meadowbrook	B/D	Frequent	Brief to long.	---	0-1.0	Apparent	Jul-Mar	---	---	Moderate	High.
50 Leon	B/D	Frequent	Brief to long.	Mar-Sep	0-1.0	Apparent	Jun-Sep	---	---	High	High.
51 Pottsburg	B/D	Occasional	Very brief	Aug-Feb	0-1.0	Apparent	Jul-Mar	---	---	High	High.
52 Meggett	D	Frequent	Long	Dec-Apr	0-1.0	Apparent	Nov-Apr	---	---	High	Moderate.
54 Troup	A	None	---	---	>6.0	---	---	---	---	Low	Moderate.
56 Kershaw	A	None	---	---	>6.0	---	---	---	---	Low	High.
58 Allanton	D	Frequent	Brief	Dec-May	0-1.0	Apparent	Dec-May	---	---	High	High.
59 Lynn Haven	B/D	None	---	---	0-1.0	Apparent	Jun-Feb	---	---	High	High.
60 Ridgeland	B/D	None	---	---	1.5-2.5	Apparent	Nov-Apr	---	---	Moderate	High.
61 Wesconnett	D	Frequent	Very long	Jun-Feb	0-1.0	Apparent	Jun-Feb	---	---	Moderate	High.
62 Neilhurst	A	None	---	---	>6.0	---	---	---	---	Low	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
63---------- Solite	B/D	None-------	---	---	0-1.0	Apparent	Jun-Nov	---	---	High----	Moderate.
64---------- Ona	B/D	None-------	---	---	0-1.0	Apparent	Jun-Sep	---	---	High----	High.
65---------- Meadowbrook	B/D	None-------	---	---	0-1.0	Apparent	Jul-Mar	---	---	Moderate	High.

* In the "High water table--Depth" column, 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.

TABLE 17.--PHYSICAL PROPERTIES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2.1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity	Bulk density (field moist)	Water content: 1/10 bar	1/3 bar	15 bar
	Cm		Pct								Cm/hr	G/cm	Pct (wt)		
Albany fine sand:															
S84FL-019-08-1	0-15	A	0.0	0.1	2.3	70.0	20.1	92.5	6.5	1.0	21.4	1.36	10.3	6.5	1.1
-2	15-41	E1	0.0	0.1	1.9	72.3	17.6	91.9	6.5	1.6	11.2	1.49	10.7	5.5	0.8
-3	41-99	E2	0.0	0.1	1.8	71.5	19.0	92.4	6.3	1.3	11.0	1.53	9.1	4.2	0.6
-4	99-119	E3	0.0	0.1	1.6	72.7	20.2	94.6	4.7	0.7	12.1	1.59	6.9	2.6	0.3
-5	119-152	Bt	0.0	0.0	1.3	57.1	16.1	74.5	8.9	16.6	0.3	1.74	18.5	17.0	5.1
-6	152-203	Btg	0.0	0.0	1.0	46.0	17.9	64.9	7.7	27.4	0.3	1.68	19.2	18.6	9.2
Blanton fine sand:															
S83FL-019-01-1	0-15	A	0.0	0.2	3.2	86.1	5.8	95.3	2.9	1.8	117.0	1.10	9.6	6.8	2.1
-2	15-51	E1	0.0	0.2	2.8	82.3	10.0	95.3	3.5	1.2	35.5	1.42	5.6	3.4	0.6
-3	51-117	E2	0.0	0.2	2.8	83.1	10.2	96.3	2.7	1.0	33.5	1.36	7.8	5.6	0.5
-4	117-147	E3	0.0	0.2	2.9	82.6	9.7	95.4	3.2	1.4	34.2	1.44	4.6	2.5	0.4
-5	147-203	Bt	0.0	0.1	1.9	60.3	8.7	71.0	5.1	23.9	0.2	1.67	18.7	17.3	8.0
Centenary fine sand:															
S84FL-019-07-1	0-13	A	0.0	0.1	4.2	88.6	3.9	96.8	2.3	0.9	34.2	1.43	7.1	5.6	1.0
-2	13-25	E1	0.0	0.2	4.0	88.3	3.1	95.6	3.2	1.2	31.2	1.50	5.9	3.8	0.7
-3	25-89	E2	0.0	0.2	4.3	88.6	2.8	95.9	3.0	1.1	33.5	1.52	4.7	2.9	0.6
-4	89-109	E3	0.0	0.2	4.1	88.9	3.2	96.4	2.6	1.0	22.7	1.53	6.2	4.0	0.6
-5	109-137	E4	0.0	0.2	4.1	89.3	2.8	96.4	2.6	1.0	34.2	1.51	5.1	2.8	0.3
-6	137-152	Bh1	0.0	0.2	4.5	89.3	2.4	96.4	2.4	1.2	19.7	1.53	6.9	4.2	0.6
-7	152-203	Bh2	0.0	0.2	6.0	88.2	2.2	96.6	2.6	0.8	36.8	1.48	7.9	5.6	0.5
Hurricane fine sand:															
S83FL-019-02-1	0-13	A	0.0	0.1	4.9	87.8	2.3	95.1	3.4	1.5	48.0	1.33	7.1	4.5	1.3
-2	13-25	E1	0.0	0.1	4.7	87.0	2.3	94.1	4.3	1.6	40.8	1.44	5.9	3.6	0.6
-3	25-74	E2	0.0	0.1	4.8	87.9	2.3	95.1	3.6	1.3	32.9	1.41	5.5	3.5	0.6
-4	74-142	E3	0.0	0.1	4.1	89.6	2.3	96.1	3.4	0.5	24.0	1.49	3.6	1.9	0.2
-5	142-168	Bh1	0.0	0.1	4.2	89.4	1.4	95.1	2.9	2.0	17.7	1.58	7.2	4.5	0.8
-6	168-203	Bh2	0.0	0.1	4.3	91.5	1.3	97.2	1.8	1.0	19.4	1.56	6.1	3.6	0.4
Leon fine sand:															
S84FL-019-12-1	0-10	A	0.0	0.1	8.5	85.6	2.3	96.5	2.9	0.6	24.0	1.45	8.7	6.2	1.8
-2	10-41	E	0.0	0.0	8.8	85.2	2.7	96.7	2.9	0.4	32.2	1.48	4.2	2.7	0.9
-3	41-51	Bh1	0.0	0.0	8.1	80.0	2.3	90.4	6.4	3.2	1.8	1.24	33.8	27.0	5.6
-4	51-66	Bh2	0.0	0.1	8.8	81.8	2.4	93.1	2.9	4.0	16.4	1.46	15.2	11.7	3.2
-5	66-137	BE	0.0	0.1	8.9	84.1	2.4	95.5	3.4	1.1	15.4	1.58	6.2	3.8	0.5
-6	137-170	B'h1	0.0	0.0	9.2	82.0	1.0	92.2	5.8	2.0	15.4	1.59	8.8	6.3	1.2
-7	170-203	B'h2	0.0	0.0	9.5	85.5	0.5	95.5	1.3	3.2	5.1	1.54	12.0	8.3	2.1

TABLE 17.--PHYSICAL PROPERTIES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2.1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity	Bulk density (field moist)	Water content: 1/10 bar	1/3 bar	15 bar
	Cm		Pct								Cm/hr	G/cm	Pct (wt)		
Mandarin fine sand:															
S83FL-019-06-1	0-13	A	0.0	0.1	4.9	87.0	4.9	96.9	2.7	0.4	33.2	1.30	12.3	8.2	2.1
-2	13-71	E	0.0	0.2	5.3	87.0	4.5	97.0	2.8	0.2	24.7	1.51	4.0	2.4	0.7
-3	71-84	Bh1	0.0	0.1	4.9	80.3	4.2	89.5	5.7	4.8	19.1	1.20	32.2	24.8	3.7
-4	84-96	Bh2	0.0	0.2	5.2	82.6	4.1	92.1	4.4	3.5	29.3	1.44	12.4	9.4	1.3
-5	96-127	BE	0.0	0.2	5.0	85.9	4.4	95.5	3.7	0.8	20.1	1.54	7.1	4.4	0.5
-6	127-152	E'	0.0	0.1	5.2	84.4	3.4	93.1	5.7	1.2	16.8	1.55	5.8	3.4	0.4
-7	152-203	B'h	0.0	0.1	4.4	77.5	3.5	85.5	11.4	3.1	6.4	1.73	14.1	12.5	1.8
Meadowbrook sand:															
S84FL-019-14-1	0-18	A	0.0	3.9	36.5	36.3	15.0	91.7	7.5	0.8	30.2	1.34	18.9	12.6	2.7
-2	18-89	Eg1	0.0	3.8	36.4	36.7	15.5	92.4	6.4	1.2	12.2	1.62	8.4	4.2	0.8
-3	89-107	Eg2	0.0	5.2	41.3	33.6	12.5	92.6	5.8	1.6	0.2	1.79	6.4	2.9	0.3
-4	107-178	Btg1	0.0	3.9	35.6	28.7	11.7	79.9	10.0	10.1	0.1	1.95	11.3	9.7	2.9
-5	178-203	Btg2	0.1	5.4	37.2	27.1	11.0	80.8	7.8	11.4	0.1	1.81	15.6	14.7	4.4
Meggett sandy loam:															
S84FL-019-17-1	0-15	A	0.1	0.4	1.9	45.4	19.8	67.5	26.2	6.3	0.2	1.44	23.8	17.5	4.0
-2	15-28	Eg	0.2	0.3	2.0	44.6	21.8	69.0	24.2	6.8	0.1	1.78	13.7	11.2	3.4
-3	28-58	Btg1	0.0	0.2	1.1	27.2	14.8	43.3	19.3	37.4	0.1	1.71	18.5	17.0	7.2
-4	58-117	Btg2	0.0	0.1	1.0	29.3	14.8	45.2	19.8	35.0	0.1	1.58	25.2	23.5	13.7
-5	117-157	Btg3	0.0	0.0	0.8	26.3	13.5	40.6	21.8	37.6	0.0	1.43	30.6	28.1	14.9
-6	157-203	Btg3	0.0	0.0	0.7	25.3	9.9	35.9	22.1	42.0	0.0	1.34	35.4	32.1	17.2
Newnan fine sand:															
S84FL-019-09-1	0-18	A	0.0	0.1	3.8	76.4	14.6	94.9	4.4	0.7	53.2	1.21	14.5	9.9	3.0
-2	18-28	E1	0.0	0.1	3.4	77.3	14.2	95.0	4.4	0.6	12.2	1.40	13.5	8.6	1.5
-3	28-48	E2	0.0	0.1	3.2	76.9	14.7	94.9	4.7	0.4	11.4	1.54	7.2	3.2	0.4
-4	48-58	Bh1	0.0	0.1	2.8	70.5	15.4	88.8	7.1	4.1	15.6	1.21	34.6	25.0	4.0
-5	58-74	Bh2	0.0	0.1	2.7	71.3	16.6	90.7	6.0	3.3	9.9	1.42	18.3	12.0	2.4
-6	74-102	E'1	0.0	0.1	2.8	74.1	17.8	94.8	4.2	1.0	17.4	1.52	10.5	5.7	0.9
-7	102-130	E'2	0.0	0.1	2.6	72.9	19.3	94.9	4.5	0.6	15.5	1.62	7.8	3.4	0.6
-8	130-203	Btg	0.0	0.0	2.3	57.0	12.9	72.2	6.2	21.6	2.1	1.77	16.7	15.5	5.1
Ortega fine sand:															
S83FL-019-04-1	0-8	A	0.1	0.4	6.0	88.9	3.3	98.6	0.5	0.9	41.4	1.31	5.7	3.4	0.8
-2	8-46	C1	0.1	0.4	5.5	87.8	3.9	97.6	1.2	1.2	32.9	1.41	5.1	2.7	0.6
-3	46-122	C2	0.0	0.3	4.7	88.8	4.1	97.9	0.9	1.2	34.8	1.42	3.8	1.9	0.4
-4	122-157	C3	0.0	0.3	4.6	89.6	4.0	98.5	0.7	0.8	28.3	1.43	3.5	1.8	0.3
-5	157-203	C4	0.0	0.8	9.8	84.6	3.4	98.6	0.7	0.7	36.2	1.43	3.0	1.3	0.3

TABLE 17.--PHYSICAL PROPERTIES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2.1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity	Bulk density (field moist)	Water content: 1/10 bar	1/3 bar	15 bar
	Cm		Pct								Cm/hr	G/cm	Pct (wt)		
Pelham loamy fine sand:															
S84FL-019-11-1	0-10	Ap	0.0	0.1	0.7	43.7	44.9	89.4	8.1	2.5	46.0	1.17	32.0	18.8	4.3
-2	10-51	Eg1	0.0	0.1	0.7	42.9	45.4	89.1	9.3	1.6	13.0	1.53	14.4	5.8	0.9
-3	51-66	Eg2	0.0	0.1	0.5	38.6	48.3	87.5	10.6	1.9	7.9	1.54	15.6	5.8	0.9
-4	66-114	Btg1	0.0	0.0	0.2	18.1	47.3	65.6	11.6	22.8	1.1	1.61	23.0	21.4	7.8
-5	114-162	Btg1	0.0	0.0	0.1	22.5	47.0	69.6	10.8	19.6	0.3	1.65	22.1	20.7	7.7
-6	162-203	Btg2	0.0	0.0	0.0	34.0	36.9	70.9	10.7	18.4	0.3	1.63	21.6	18.2	6.0
Penney fine sand:															
S83FL-019-05-1	0-8	A	0.0	1.4	11.7	81.6	2.6	97.3	1.3	1.4	36.2	1.32	6.7	4.2	1.0
-2	8-43	E1	0.0	1.8	12.5	79.4	2.7	96.4	2.1	1.5	25.0	1.38	6.8	4.0	0.9
-3	43-114	E2	0.0	1.2	10.6	82.2	2.9	96.9	1.3	1.8	23.7	1.44	3.7	2.0	0.7
-4	114-145	E3	0.0	1.1	9.3	83.5	3.2	97.1	1.8	1.1	46.0	1.43	3.5	2.0	0.5
-5	145-203	E&B	0.0	1.0	9.5	83.2	2.9	96.6	1.5	1.9	26.3	1.47	3.6	2.0	0.6
Pottsburg fine sand:															
S84FL-019-13-1	0-18	A	0.0	0.1	7.6	82.6	3.8	94.1	4.9	1.0	30.9	1.38	9.7	7.5	1.6
-2	18-71	E1	0.0	0.1	7.8	84.2	4.1	96.2	3.1	0.7	12.0	1.57	5.9	3.5	1.0
-3	71-140	E2	0.0	0.0	8.2	82.4	3.3	93.9	4.7	1.4	9.7	1.63	5.5	3.6	0.5
-4	140-160	Bh1	0.0	0.0	8.6	82.9	1.9	93.4	4.4	2.2	2.7	1.62	15.8	9.2	1.7
-5	160-203	Bh2	0.0	0.0	9.4	85.6	1.3	96.3	0.4	3.3	2.8	1.53	17.1	10.9	2.5
Ridgewood fine sand:															
S83FL-019-03-1	0-13	A	0.0	1.0	13.7	79.7	2.0	96.4	2.1	1.5	31.6	1.43	6.8	4.8	1.0
-2	13-33	C1	0.0	1.0	13.2	78.9	2.8	95.9	2.3	1.8	23.7	1.58	5.9	3.8	0.7
-3	33-61	C2	0.0	1.1	14.2	78.3	2.6	96.2	2.2	1.6	48.0	1.48	4.2	2.6	0.5
-4	61-142	C3	0.0	1.4	13.2	80.3	2.7	97.6	1.5	0.9	35.5	1.51	3.9	2.2	0.3
-5	142-203	C4	0.0	1.4	12.4	82.6	2.3	98.7	0.5	0.8	25.0	1.54	3.1	1.4	0.2

TABLE 18.--CHEMICAL ANAYLSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Mg	Na	K	Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH: H_2O (1:1)	$CaCl_2$ 0.1m (1:2)	KCl (1:1)	Pyrophosphate extractable: C	Fe	Al	Citrate dithionite extractable: Fe	Al
	Cm		--Milliequivalents/100 grams of soil--							Pct	Pct	Mmhos/cm				Pct	Pct	Pct	Pct	Pct
Albany fine sand:																				
S84FL-019-08-1	0-15	A	0.05	0.03	0.06	0.01	0.15	2.61	2.76	5	0.68	0.00	3.6	3.6	3.5	---	---	---	---	---
-2	15-41	E1	0.02	0.01	0.04	0.00	0.07	1.70	1.77	4	0.42	0.00	4.3	4.4	4.7	---	---	---	---	---
-3	41-99	E2	0.02	0.02	0.03	0.00	0.07	0.60	0.67	10	0.16	0.00	4.0	4.6	4.8	---	---	---	---	---
-4	99-119	E3	0.02	0.03	0.05	0.00	0.10	0.47	0.57	18	0.09	0.00	4.1	4.7	5.0	---	---	---	---	---
-5	119-152	Bt	0.18	0.01	0.04	0.02	0.25	3.47	3.72	7	0.12	0.00	4.1	4.0	4.4	---	---	---	0.58	0.15
-6	152-203	Btg	0.05	0.14	0.09	0.03	0.51	4.64	5.15	10	0.14	0.00	4.0	3.9	4.2	---	---	---	0.27	0.10
Blanton fine sand:																				
S83FL-019-01-1	0-15	A	0.47	0.09	0.06	0.02	0.64	4.39	5.03	13	0.65	0.01	4.8	4.3	4.4	---	---	---	---	---
-2	15-51	E1	0.30	0.03	0.03	0.00	0.36	1.37	1.73	21	0.11	0.01	5.5	5.1	5.3	---	---	---	---	---
-3	51-117	E2	0.17	0.02	0.03	0.00	0.22	0.94	1.16	19	0.01	0.00	5.6	5.3	5.5	---	---	---	---	---
-4	117-147	E3	0.09	0.02	0.02	0.00	0.13	0.89	1.02	13	0.02	0.00	5.1	4.8	4.9	---	---	---	---	---
-5	147-203	Bt	0.43	1.13	0.08	0.06	1.70	7.76	9.46	18	0.01	0.00	4.6	4.0	4.0	---	---	---	0.06	0.10
Centenary fine sand:																				
S84FL-019-07-1	0-13	A	0.47	0.10	0.05	0.01	0.63	4.65	5.28	12	1.28	0.01	3.9	3.3	3.5	---	---	---	---	---
-2	13-25	E1	0.10	0.03	0.04	0.01	0.18	1.75	1.93	9	0.40	0.00	4.2	3.9	4.2	---	---	---	---	---
-3	25-89	E2	0.07	0.05	0.06	0.01	0.19	0.12	0.31	61	0.15	0.01	4.3	4.3	4.6	---	---	---	---	---
-4	89-109	E3	0.04	0.03	0.05	0.00	0.12	0.80	0.92	13	0.10	0.00	4.6	4.5	4.8	---	---	---	---	---
-5	109-137	E4	0.02	0.02	0.04	0.00	0.08	0.87	0.95	8	0.08	0.00	4.9	4.5	5.0	---	---	---	---	---
-6	137-152	Bh1	0.05	0.03	0.05	0.00	0.13	0.59	0.72	18	0.12	0.00	4.5	4.4	4.7	0.12	0.01	0.06	0.05	0.04
-7	152-203	Bh2	0.04	0.02	0.04	0.00	0.10	1.95	2.05	5	0.42	0.00	4.3	4.6	4.8	0.12	0.02	0.07	0.06	0.06
Hurricane fine sand:																				
S83FL-019-02-1	0-13	A	0.14	0.04	0.03	0.02	0.23	5.62	5.85	4	0.56	0.01	4.0	3.7	3.8	---	---	---	---	---
-2	13-25	E1	0.04	0.02	0.03	0.01	0.10	2.86	2.96	3	0.24	0.01	4.4	4.5	4.7	---	---	---	---	---
-3	25-74	E2	0.03	0.01	0.02	0.00	0.06	2.10	2.16	3	0.08	0.00	4.5	4.6	4.7	---	---	---	---	---
-4	74-142	E3	0.02	0.01	0.01	0.00	0.04	0.89	0.93	4	0.05	0.00	4.7	4.8	4.9	---	---	---	---	---
-5	142-168	Bh1	0.01	0.01	0.02	0.00	0.04	3.48	3.52	1	0.27	0.00	4.4	4.7	4.8	0.09	0.03	0.09	0.10	0.08
-6	168-203	Bh2	0.02	0.01	0.01	0.00	0.04	3.53	3.57	1	0.34	0.00	4.4	4.8	4.8	0.06	0.02	0.07	0.10	0.06
Leon fine sand:																				
S84FL-019-12-1	0-10	A	0.10	0.04	0.02	0.01	0.17	3.06	3.23	5	0.54	0.07	4.4	3.6	3.2	---	---	---	---	---
-2	10-41	E	0.01	0.01	0.01	0.00	0.03	0.76	0.79	4	0.12	0.05	5.2	4.2	3.7	---	---	---	---	---
-3	41-51	Bh1	0.10	0.04	0.03	0.01	0.18	15.86	16.04	1	2.29	0.09	4.2	3.6	3.5	1.50	0.01	0.20	0.06	0.18
-4	51-66	Bh2	0.06	0.02	0.02	0.00	0.10	23.14	23.24	0	1.88	0.06	4.4	4.0	3.7	1.60	0.01	0.41	0.08	0.42
-5	66-137	BE	0.01	0.01	0.01	0.00	0.03	0.15	0.18	17	0.18	0.05	5.2	4.4	4.2	---	---	---	---	---
-6	137-170	B'h1	0.01	0.01	0.01	0.00	0.03	2.39	2.42	1	0.34	0.04	5.0	4.7	4.2	0.41	0.01	0.11	0.10	0.08
-7	170-203	B'h2	0.01	0.01	0.01	0.00	0.03	13.32	13.35	0	1.05	0.05	4.9	4.7	4.1	1.13	0.01	0.38	0.07	0.27

TABLE 18.--CHEMICAL ANAYLSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Mg	Na	K	Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH: H_2O (1:1)	$CaCl_2$ 0.1m (1:2)	KCl (1:1)	Pyrophosphate extractable: C	Fe	Al	Citrate dithionite extractable: Fe	Al
	Cm		--Milliequivalents/100 grams of soil--							Pct	Pct	Mmhos/cm				Pct	Pct	Pct	Pct	Pct
Mandarin fine sand:																				
S83FL-019-06-1	0-13	A	0.42	0.13	0.04	0.02	0.61	9.42	10.03	6	1.26	0.01	3.9	3.3	3.3	---	---	---	---	---
-2	13-71	E	0.07	0.02	0.01	0.00	0.10	3.30	3.40	3	0.15	0.00	4.4	3.9	4.1	---	---	---	---	---
-3	71-84	Bh1	0.08	0.04	0.08	0.01	0.21	21.35	21.56	1	2.43	0.01	4.0	3.7	4.0	0.06	0.3	0.19	0.06	0.20
-4	84-96	Bh2	0.07	0.03	0.05	0.01	0.16	17.75	17.91	1	1.60	0.01	4.0	3.9	4.2	0.29	0.1	0.17	0.05	0.18
-5	96-127	BE	0.04	0.01	0.03	0.01	0.09	5.34	5.43	2	0.22	0.00	4.4	4.3	4.6	0.09	0.1	0.04	0.09	0.04
-6	127-152	E'	0.04	0.02	0.03	0.00	0.09	5.32	5.41	2	0.18	0.00	4.4	4.3	4.6	---	---	---	---	---
-7	152-203	B'h	0.02	0.01	0.01	0.00	0.04	17.88	17.92	0	1.12	0.01	4.2	4.3	4.5	0.35	0.01	0.07	0.06	0.22
Meadowbrook sand:																				
S84FL-019-14-1	0-18	A	0.06	0.08	0.09	0.02	0.25	31.56	31.81	1	1.05	0.11	4.1	3.4	3.0	---	---	---	---	---
-2	18-89	Eg1	0.02	0.03	0.02	0.00	0.07	0.64	0.71	10	2.32	0.05	5.4	4.6	3.9	---	---	---	---	---
-3	89-107	Eg2	0.01	0.01	0.02	0.00	0.04	0.52	0.56	7	0.16	0.05	5.8	4.8	4.3	---	---	---	---	---
-4	107-178	Btg1	0.25	0.27	0.09	0.01	0.62	0.59	1.21	51	0.14	0.03	5.7	4.3	3.9	---	---	---	0.93	0.12
-5	178-203	Btg2	0.68	0.66	0.12	0.01	1.47	1.02	2.49	59	0.08	0.02	5.3	4.1	3.7	---	---	---	0.34	0.09
Meggett sandy loam:																				
S84FL-019-17-1	0-15	A	1.20	0.66	0.10	0.04	2.01	7.41	9.42	21	2.10	0.03	4.6	4.0	3.7	---	---	---	---	---
-2	15-28	Eg	0.86	0.66	0.07	0.02	1.61	1.56	3.17	51	0.45	0.05	5.1	4.2	3.9	---	---	---	---	---
-3	28-58	Btg1	6.00	3.87	0.32	0.11	10.30	10.04	20.34	51	0.43	0.06	5.1	4.1	3.6	---	---	---	0.12	0.08
-4	58-117	Btg2	10.25	5.18	0.60	0.29	16.32	7.91	24.23	67	0.23	0.06	5.3	4.2	3.4	---	---	---	0.03	0.05
-5	117-157	Btg3	15.15	6.75	0.95	0.57	23.42	7.60	31.02	75	0.38	0.01	5.6	4.4	3.6	---	---	---	0.04	0.04
-6	157-203	Btg3	18.30	9.88	1.39	0.61	30.18	8.15	38.33	79	0.19	0.02	5.9	4.8	4.0	---	---	---	0.04	0.03
Newnan fine sand:																				
S84FL-019-09-1	0-18	A	0.35	0.29	0.12	0.03	0.79	4.88	5.67	14	1.60	0.00	3.5	3.1	3.1	---	---	---	---	---
-2	18-28	E1	0.14	0.16	0.12	0.00	0.42	3.00	3.42	12	0.67	0.00	3.7	3.2	3.3	---	---	---	---	---
-3	28-48	E2	0.03	0.08	0.08	0.00	0.19	0.27	0.46	41	0.12	0.00	4.2	3.9	4.0	---	---	---	---	---
-4	48-58	Bh1	0.15	0.02	0.02	0.01	0.20	16.47	16.67	1	2.10	0.01	3.5	3.5	3.8	1.27	0.01	0.17	0.04	0.16
-5	58-74	Bh2	0.04	0.04	0.08	0.00	0.16	12.64	12.80	1	1.35	0.00	3.6	3.5	4.2	1.01	0.01	0.17	0.03	0.17
-6	74-102	E'1	0.02	0.02	0.05	0.00	0.09	1.24	1.33	7	0.30	0.00	4.2	3.8	4.6	---	---	---	---	---
-7	102-130	E'2	0.05	0.01	0.02	0.00	0.08	1.96	2.04	4	0.17	0.00	4.1	4.2	4.7	---	---	---	---	---
-8	130-203	Btg	0.09	0.16	0.07	0.01	0.33	5.10	5.43	6	0.21	0.00	4.3	4.5	4.3	---	---	---	0.08	0.08
Ortega fine sand:																				
S83FL-019-04-1	0-8	A	0.23	0.04	0.04	0.01	0.32	6.08	6.40	5	0.91	0.01	4.2	3.9	3.7	---	---	---	---	---
-2	8-46	C1	0.03	0.01	0.02	0.00	0.06	1.57	1.63	4	0.34	0.01	6.2	5.0	4.8	---	---	---	---	---
-3	46-122	C2	0.03	0.01	0.02	0.00	0.06	1.28	1.34	4	0.07	0.02	5.1	4.5	4.8	---	---	---	---	---
-4	122-157	C3	0.03	0.01	0.01	0.00	0.05	1.33	1.38	4	0.04	0.01	5.0	4.6	4.9	---	---	---	---	---
-5	157-203	C4	0.02	0.01	0.01	0.00	0.04	1.20	1.24	3	0.06	0.00	5.0	4.8	5.1	---	---	---	---	---

TABLE 18.--CHEMICAL ANAYLSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases					Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH			Pyrophosphate extractable			Citrate dithionite extractable	
			Ca	Mg	Na	K	Sum						H_2O (1:1)	$CaCl_2$ 0.1m (1:2)	KCl (1:1)	C	Fe	Al	Fe	Al
	Cm		--Milliequivalents/100 grams of soil--							Pct	Pct	Mmhos/cm				Pct	Pct	Pct	Pct	Pct
Pelham loamy fine sand:																				
S84FL-019-11-1	0-10	Ap	4.81	1.44	0.16	0.06	6.47	4.36	10.83	60	1.63	0.20	5.2	5.6	5.7	---	---	---	---	---
-2	10-51	Eg1	1.22	0.10	0.13	0.01	1.46	2.46	3.92	37	0.40	0.01	5.2	5.4	5.5	---	---	---	---	---
-3	51-66	Eg2	0.30	0.05	0.10	0.01	0.46	1.64	2.10	22	0.16	0.00	5.0	4.9	4.9	---	---	---	---	---
-4	66-114	Btg1	1.49	1.83	0.48	0.12	3.92	8.96	12.88	30	0.08	0.20	3.9	4.0	4.0	---	---	---	1.08	0.15
-5	114-162	Btg1	0.82	3.09	0.55	0.13	4.59	9.26	13.85	33	0.07	0.20	3.7	3.9	4.0	---	---	---	0.81	0.12
-6	162-203	Btg2	0.82	3.29	0.58	0.11	4.80	8.52	13.32	36	0.10	0.20	4.0	3.9	3.9	---	---	---	0.70	0.10
Penney fine sand:																				
S83FL-019-05-1	0-8	A	0.47	0.10	0.04	0.02	0.63	7.36	7.99	8	1.23	0.01	4.3	3.9	4.0	---	---	---	---	---
-2	8-43	E1	0.04	0.02	0.03	0.00	0.09	4.81	4.90	2	0.26	0.00	4.5	4.4	4.6	---	---	---	---	---
-3	43-114	E2	0.07	0.04	0.02	0.01	0.14	3.36	3.50	4	0.12	0.00	4.7	4.5	4.7	---	---	---	---	---
-4	114-145	E3	0.05	0.04	0.02	0.01	0.12	3.60	3.72	3	0.06	0.00	4.9	4.7	4.7	---	---	---	---	---
-5	145-203	E&B	0.06	0.03	0.05	0.08	0.22	3.62	3.84	6	0.09	0.00	5.4	4.7	4.8	---	---	---	0.09	0.07
Pottsburg fine sand:																				
S84FL-019-13-1	0-18	A	0.03	0.02	0.02	0.00	0.07	2.73	2.80	3	0.49	0.07	4.5	3.7	3.3	---	---	---	---	---
-2	18-71	E1	0.00	0.01	0.01	0.00	0.02	0.00	0.02	100	0.11	0.04	4.9	4.7	4.2	---	---	---	---	---
-3	71-140	E2	0.01	0.02	0.01	0.00	0.04	1.54	1.58	3	0.26	0.04	5.8	4.7	4.2	---	---	---	---	---
-4	140-160	Bh1	0.00	0.01	0.01	0.00	0.03	8.39	8.42	0	0.87	0.05	4.9	4.8	3.9	0.86	0.00	0.18	0.07	0.12
-5	160-203	Bh2	0.02	0.04	0.21	0.00	0.27	14.26	14.53	2	0.12	0.21	4.9	4.3	3.7	1.90	0.00	0.31	0.09	0.21
Ridgewood fine sand:																				
S83FL-019-03-1	0-13	A	0.22	0.07	0.05	0.01	0.35	5.02	5.37	7	0.65	0.01	4.1	4.0	4.0	---	---	---	---	---
-2	13-33	C1	0.05	0.02	0.04	0.00	0.11	2.11	2.22	5	0.13	0.00	4.6	4.7	4.8	---	---	---	---	---
-3	33-61	C2	0.03	0.02	0.02	0.00	0.07	1.73	1.80	4	0.05	0.00	4.6	4.7	4.8	---	---	---	---	---
-4	61-142	C3	0.03	0.02	0.01	0.00	0.06	0.91	0.97	6	0.07	0.00	4.5	4.7	4.8	---	---	---	---	---
-5	142-203	C4	0.02	0.01	0.01	0.00	0.04	0.53	0.57	7	0.05	0.00	4.7	4.8	4.9	---	---	---	---	---

TABLE 19.--CLAY MINERALOGY OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Percentage of clay minerals			
			Montmor-illonite	14 Angstrom intergrade	Kaolinite	Quartz
	Cm					
Albany fine sand:						
S84FL-019-08-1	0-15	A	17	47	16	20
-3	119-152	Bt	11	39	38	12
-4	152-203	Btg	16	14	60	10
Blanton fine sand:						
S83FL-019-01-1	0-15	A	0	43	30	27
-3	51-117	E2	0	22	9	69
-5	147-203	Bt	0	18	68	14
Centenary fine sand:						
S84FL-019-07-1	0-13	A	20	37	13	30
-6	137-152	Bh1	15	25	7	53
Hurricane fine sand:						
S83FL-019-02-1	0-13	A	0	42	14	44
-5	142-168	Bh1	0	26	7	67
-6	168-203	Bh2	0	9	4	87
Leon fine sand:						
S84FL-019-12-1	0-10	A	20	9	14	57
-4	51-66	Bh2	11	22	6	61
-7	170-203	B'h2	0	30	7	63
Mandarin fine sand:						
S83FL-019-06-1	0-13	A	0	0	0	100
-3	71-84	Bh1	18	24	11	47
-7	152-203	B'h	14	9	7	69
Meadowbrook fine sand:						
S84FL-019-14-1	0-18	A	0	36	10	54
-4	107-178	Btg1	0	37	37	26
Meggett sandy loam:						
S84FL-019-17-1	0-15	A	39	23	30	8
-4	58-117	Btg2	82	0	16	2
-6	157-203	Btg3	88	0	10	2
Newnan fine sand:						
S84FL-019-09-1	0-18	A	0	0	0	100
-4	48-58	Bh1	14	36	18	32
-8	130-203	Btg	11	28	55	6
Ortega fine sand:						
S83FL-019-04-1	0-8	A	0	42	15	43
-3	46-122	C2	0	49	11	40
-5	157-203	C4	0	8	3	89
Pelham fine sand:						
S84FL-019-11-1	0-10	Ap	13	23	29	35
-4	66-114	Btg1	36	13	36	15
-6	166-203	Btg2	72	6	17	5
Penney fine sand:						
S83FL-019-05-1	0-8	A	0	40	14	46
-3	43-114	E2	0	38	9	53
-5	145-203	E&B	21	29	13	37

TABLE 19.--CLAY MINERALOGY OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Percentage of clay minerals			
			Montmor-illonite	14 Angstrom intergrade	Kaolinite	Quartz
	Cm					
Pottsburg fine sand:						
S84FL-019-13-1	0-18	A	22	18	6	54
-5	160-203	Bh2	0	0	0	100
Ridgewood fine sand:						
S83FL-019-03-1	0-13	A	0	54	15	31
-3	33-61	C2	0	49	11	40
-5	142-203	C4	0	17	6	77

TABLE 20.--ENGINEERING INDEX 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). See the section "Soil Series and Their Morphology" for location of pedon sampled. NP means nonplastic']

Soil name, report number, horizon, and depth in inches	Classification		Mechanical analyses								Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve--				Percentage smaller than--							
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.05 mm	.02 mm	.005 mm	.002 mm			Maximum dry density	Optimum moisture
											Pct		Lb/ft^3	Pct
Blanton fine sand: (S83FL-019-01)														
Bt -------- 58-80	A-2-6(1)	SC	100	100	100	32	29	28	24	23	34	18	111.6	14.8
Centenary fine sand: (S84FL-019-07)														
Bh2 ------- 60-80	A-3(0)	SP	100	100	100	3	3	3	2	2	---	NP	101.0	16.1
Hurricane fine sand: (S83FL-019-02)														
Bh2 ------- 66-80	A-3(0)	SP	100	100	100	4	4	4	2	2	---	NP	102.6	12.9
Leon fine sand: (S84FL-019-12)														
Bh1 & Bh2 - 16-26	A-2-4(0)	SM	100	100	100	13	11	7	4	1	---	NP	100.5	15.7
B'h2 ------ 67-80	A-3(0)	SP-SM	100	100	100	6	5	2	0	0	---	NP	104.0	13.9
Mandarin fine sand: (S83FL-019-06)														
Bh1 ------- 28-33	A-2-4(0)	SM	100	100	100	13	8	2	0	0	---	NP	101.5	14.7
Meadowbrook fine sand: (S84FL-019-14)														
Btg1 ------ 42-70	A-2-4(0)	SM	100	100	90	24	20	15	12	11	---	NP	122.5	10.7
Newnan fine sand: (S84FL-019-09)														
Bh1 ------- 19-23	A-2-4(0)	SM	100	100	100	16	11	5	1	0	---	NP	96.7	17.3
Btg ------- 51-80	A-2-6(1)	SC	100	100	100	34	33	29	25	25	31	15	113.1	14.5
Ortega fine sand: (S83FL-019-04)														
C2 -------- 18-48	A-3(0)	SP	100	100	99	3	3	3	2	2	---	NP	98.9	15.2
Pelham loamy fine sand: (S84FL-019-11)														
Btg2 ------ 64-80	A-6(7)	CL	100	100	100	54	40	27	21	21	39	19	110.2	15.1
Penney fine sand: (S83FL-019-05)														
E&B ------- 57-80	A-3(0)	SP-SM	100	100	98	5	4	4	3	3	---	NP	101.8	11.7
Pottsburg fine sand: (S83FL-019-13)														
Bh2 ------- 63-80	A-3(0)	SP-SM	100	100	100	7	6	4	2	2	---	NP	104.7	13.3
Ridgewood fine sand: (S83FL-019-03)														
C3 -------- 24-56	A-3(0)	SP-SM	100	100	98	6	4	3	2	1	---	NP	101.4	11.3

TABLE 21.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Albany	Loamy, siliceous, thermic Grossarenic Paleudults
Allanton	Sandy, siliceous, thermic Grossarenic Haplaquods
Arents	Arents
Blanton	Loamy, siliceous, thermic Grossarenic Paleudults
Centenary	Sandy, siliceous, thermic Grossarenic Entic Haplohumods
Goldhead	Loamy, siliceous, thermic Arenic Ochraqualfs
Hurricane	Sandy, siliceous, thermic Grossarenic Entic Haplohumods
Kershaw	Thermic, uncoated Typic Quartzipsamments
Leon	Sandy, siliceous, thermic Aeric Haplaquods
Lynn Haven	Sandy, siliceous, thermic Typic Haplaquods
Mandarin	Sandy, siliceous, thermic Typic Haplohumods
Maurepas	Euic, thermic Typic Medisaprists
Meadowbrook	Loamy, siliceous, thermic Grossarenic Ochraqualfs
Meggett	Fine, mixed, thermic Typic Albaqualfs
Neilhurst	Hyperthermic, uncoated Typic Quartzipsamments
Newnan	Sandy, siliceous, hyperthermic Ultic Haplohumods
Ocilla	Loamy, siliceous, thermic Aquic Arenic Paleudults
Ona	Sandy, siliceous, hyperthermic Typic Haplaquods
Ortega	Thermic, uncoated Typic Quartzipsamments
Osier	Siliceous, thermic Typic Psammaquents
Ousley	Thermic, uncoated Aquic Quartzipsamments
Pamlico	Sandy or sandy-skeletal, siliceous, dysic, thermic Terric Medisaprists
Pelham	Loamy, siliceous, thermic Arenic Paleaquults
Penney	Thermic, uncoated Typic Quartzipsamments
Plummer	Loamy, siliceous, thermic Grossarenic Paleaquults
Pottsburg	Sandy, siliceous, thermic Grossarenic Haplaquods
Quartzipsamments	Quartzipsamments
Ridgeland	Sandy, siliceous, thermic Typic Haplohumods
Ridgewood	Thermic, uncoated Aquic Quartzipsamments
Rutlege	Sandy, siliceous, thermic Typic Humaquepts
Santee	Fine, mixed, thermic Typic Argiaquolls
Sapelo	Sandy, siliceous, thermic Ultic Haplaquods
Scranton	Siliceous, thermic Humaqueptic Psammaquents
Solite	Siliceous, thermic Typic Psammaquents
Surrency	Loamy, siliceous, thermic Arenic Umbric Paleaquults
Troup	Loamy, siliceous, thermic Grossarenic Paleudults
Wesconnett	Sandy, siliceous, thermic Typic Haplaquods

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