United States
Department of
Agriculture

Natural
Resources
Conservation
Service

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

Soil Survey of Baker County, Florida

How To Use This Soil Survey

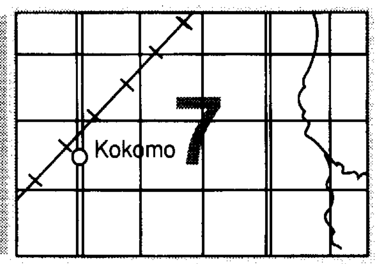
General Soil Map

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.

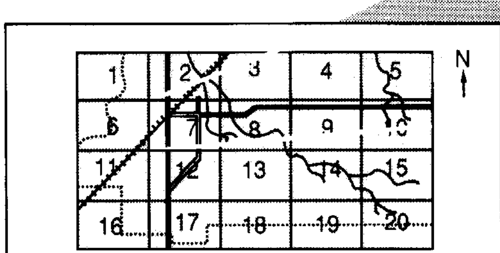
Detailed Soil Maps

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

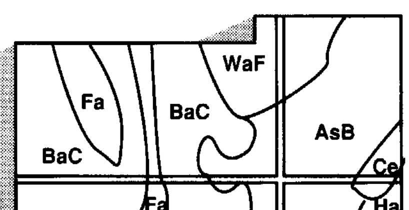
To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



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 Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1990. Fieldwork for the soil survey of the Osceola National Forest was completed in 1973, and that survey was transferred to the field sheets for this soil survey. Soil names and descriptions for this survey were approved in 1990. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1990. This soil survey was made cooperatively by the Natural Resources Conservation Service; the Forest Service; the University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations, and Soil Science Department; the Florida Department of Agriculture and Consumer Services; and the Baker County Board of Commissioners. The survey is part of the technical assistance furnished to the Baker County Soil and Water Conservation District.

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

Cover: Broomsedge bluestem in an area of Mascotte fine sand. The cypress trees in the background are in an area of Pantego-Pamlico, loamy substratum, complex, depressional, that is surrounded by a forested area of slash pine.

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Issued April 1996

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Foreword

This soil survey contains information that can be used in land-planning programs in Baker 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 ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

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 Natural Resources Conservation Service or the Cooperative Extension Service.

T. Niles Glasgow
State Conservationist
Natural Resources Conservation Service

Soil Survey of
Baker County, Florida

By Frank C. Watts, Natural Resources Conservation Service

Fieldwork by Frank C. Watts, Terry S. Bowerman, Robert A. Casteel, Donna Hinz, Anthony Jenkins, James C. Remley, Todd J. Solem, Allan Younk, and David Vyain, Natural Resources Conservation Service, and Peter E. Avers and Kenneth C. Bracy, Forest Service

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

BAKER COUNTY is in northeast Florida (fig. 1). It is bordered on the west by Columbia County, on the south by Union and Bradford Counties, on the east by Duval and Clay Counties, on the northeast by Nassau County and the St. Mary's River, and on the north by the State of Georgia. The total area of the county is 588 square miles, including bodies of water and 100,672 acres in the Osceola National Forest.

Macclenny, the county seat, has a population of approximately 5,000. The total population of Baker County is about 20,000. Forestry and agriculture are the major industries in the county.

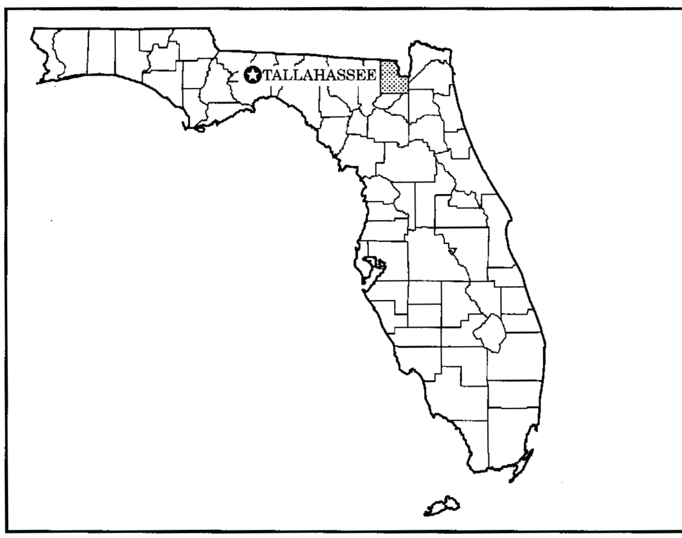

Figure 1.—Location of Baker County in Florida.

General Nature of the County

This section provides general information about the survey area. It describes history and development, climate, farming, natural resources, recreation, transportation facilities, geomorphology, stratigraphy, hydrogeology, and mineral resources.

History and Development

Patricia Dove, administrative assistant, Baker County Chamber of Commerce, and Gene Barber, local historian, prepared this section.

The survey area was originally occupied by the Timucuan Indians, as was noted by Spanish explorer Hernando de Soto in 1539 during his travels through the area. With the help of the Yamassee, Creek, and Carolinian Indians of Carolina, the English gained control of Florida in 1763. The Spanish regained control in 1783. Florida was obtained by the United States from Spain by treaty on February 21, 1821. Seminole Indians occupied much of the survey area during the early 1800's.

At various times, Baker County was part of several different counties, including Alachua, Duval, St. Johns, Columbia, and New River Counties. Until the final boundary was set in the 1920's, the extreme eastern part of Baker County was at times included in Nassau County.

Baker County is the 39th county in the State of Florida. It was named for Judge James McNeir Baker, a Confederate senator and judge of the Fourth Judicial District.

During the Civil War, a campaign culminating in the Battle of Olustee took place in the survey area. The Olustee Battlefield State Historical Site was established to commemorate this battle.

After the Civil War, Olustee became a major mill center, producing local building material. Elsewhere in the survey area, settlers established lumber mills, experimental orange groves, and other ventures. Horticulture became a major industry, and several large nurseries were founded.

As settlers moved into Baker County from Georgia on the Old Yarbrough Trail (Florida Highway 2), they built homes and stockades of hand-hewn logs for protection from the Indians *(3)*. The first masonry building in Baker County was not built until 1903.

Agriculture was limited mainly to family farms, which produced a variety of crops. A few farms produced crops for sale.

The area experienced growth and development in the second half of the 19th century. The population had increased to more than 2,300 before the yellow fever epidemic of 1888. The disease began in Jacksonville and spread west into Baker County. By the end of the epidemic, several communities had lost most or all of their population.

At the beginning of the 20th century, raising cattle, farming, lumbering, and making turpentine were the major industries. The area again experienced a period of growth after the paving of U.S. Highway 90 in 1924, but the Great Depression was felt bitterly in Baker County. Many people lost their jobs and their homes.

In 1929, the Osceola National Forest was acquired by the Forest Service as a field laboratory for forest management. After the 1930's there was little private interest in the lumber industry. Government support after the Depression included Work Projects Administration (WPA) road and bridge projects and the construction of a new courthouse.

Baker County was largely an agricultural community. The primary crop was corn. After the financial devastation of the Depression, people discovered new and innovative ways to market the corn crop. The moonshine industry flourished in Baker County until the mid-1950's.

The 1950's began another era of growth and rapid change in Baker County. The wholesale nursery industry flourished, the timber industry grew, and agricultural practices were refined. Construction of the Northeast Florida State Hospital in the middle and late 1950's provided employment for many Baker County residents.

Climate

Baker County has a moderate climate that is favorable for the production of crops, livestock, and pine trees. The summers are long, hot, and humid. The winters, which may have occasional invasions of cool or cold air from the north, are mild because the county is in the southern latitudes. Also, the Atlantic Ocean and the Gulf of Mexico moderate the temperatures.

Rainfall is heaviest from June through September. October and November are the driest months. About 49 percent of the annual rainfall occurs in the summer and results from afternoon and evening thundershowers. The remainder of the precipitation is evenly distributed throughout the rest of the year. Excessive rainfall in the spring can be expected in about 1 year out of 10. Storms during these periods can cause rivers to overflow.

The average maximum temperature shows little day-to-day variation. The temperature can be as high as 96 degrees F for at least 1 day a month during the summer. The minimum temperature in winter varies considerably from day to day, mainly because of periodic invasions of cold, dry air moving southward from across the continent. Table 1 shows summarized climatic data based on records collected at Lake City, Florida *(32, 34)*. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 55 degrees F and the average daily minimum temperature is 43 degrees. The lowest temperature on record, which occurred in 1962, is 10 degrees. In summer, the average temperature is 80 degrees and the average daily maximum temperature is 91 degrees. The highest recorded temperature, which occurred in 1954, is 105 degrees.

Most rainfall in summer occurs as afternoon or evening showers or thundershowers. As much as 2 or 3 inches of rain can fall in an hour. Daylong rains in the summer are rare and generally accompany tropical storms. Rainfall in the fall, winter, and spring is seldom as intense as it is in the summer.

Hail occasionally accompanies thunderstorms. The hailstones generally are small and seldom cause extensive damage. Snow is rare and generally melts as it hits the ground.

Tropical storms can affect the area from early in June through mid-November. The copious rains and the flooding associated with these storms can cause considerable damage.

Extended periods of dry weather can occur in any season but are most common in the spring and fall. Dry periods in the spring generally are shorter than those in the fall, but they are more serious because temperatures are higher and the need for moisture is greater.

Prevailing winds are generally northeasterly in the fall and winter and southwesterly in the spring and summer. Windspeed averages slightly less than 9 miles per hour. It is 2 or 3 miles per hour higher in early afternoon. It is slightly higher in the spring than in other seasons.

Farming

In 1987, 220 farms were in Baker County *(33)*. Seventy-seven of these farms had landowners who listed farming as their principal occupation. Land classified as agricultural land made up a large percentage of the county's acreage. Approximately 355,566 acres, or 90 percent of the total land area, was used as forest land *(35)*, about 16,921 acres was used as pastureland, and about 10,000 acres was used as cropland *(33)*. The average farm size was 127 acres. The total farm acreage was about 28,000 acres. Twenty-one of the farms in Baker County had sales of $10,000 or more *(33)*. These farms had a total acreage of 16,719 acres and an average size of 250 acres.

Farmers in Baker County produce poultry, beef, woody ornamental plants, and dairy products. They also produce smaller amounts of field crops, such as corn and tobacco. Vegetable production, both in the field and in greenhouses, is increasing in the county.

Natural Resources

Soil is the most important resource in Baker County. The soil and the underlying parent material are the source of the natural resources and the agricultural commodities produced in the county.

Water for most domestic and urban uses is supplied by underground wells. These wells tap into underground aquifers. The depth of the wells varies, but it generally ranges from 50 to 80 feet. Water for agricultural uses is supplied by wells, streams, or water-retention areas.

The St. Mary's River and Cedar, Olustee, Moccasin, and Little Creeks are the largest permanent streams. The St. Mary's River and Cedar and Moccasin Creeks flow generally to the east and empty into the Atlantic Ocean. Olustee Creek flows generally to the south and empties into the Santa Fe River, which flows to the west. The St. Mary's River and Cedar and Olustee Creeks flow permanently, except for the upper stretches during extended dry periods. The county has very few other streams. Most of these are intermittent and dry up to pools and potholes during extended dry periods.

Ocean Pond is the largest body of water in Baker County. It is about 1,750 acres in size. It is in the extreme western part of the county, just north of Olustee. It is accessible to the public.

Woodland is a major natural resource in Baker County. Forestry and forest products are an important part of the county's economy. Timber is used for lumber and pulpwood, and the wooded areas provide habitat for wildlife.

Recreation

A wide variety of recreational activities are available in Baker County. Fishing, hunting, boating, and camping are popular. The St. Mary's River and Ocean Pond, which is in the national forest, provide opportunities for fishing and boating. Large acreages of woodland are reserved for hunt clubs, which lease hunting rights from landowners. Golfing also is a popular recreational activity. There is a golf course in Macclenny (fig. 2). Other recreational facilities include swimming pools, tennis courts, football and baseball stadiums, and neighborhood playgrounds. The Olustee Battlefield State Historical Site is in the western part of the county along U.S. Highway 90.

Transportation Facilities

Baker County is served by a good transportation network. Interstate Highway 10 and U.S. Highway 90 run from east to west in the south-central part of the county. Florida Highway 121 and county roads 125, 127, 229, 231, and 250 run from north to south. Florida Highway 2 runs through the northern part of the county. Several paved and dirt roads serve other parts of the county.

There are no major passenger bus or rail services with regularly scheduled stops in Baker County, but Amtrak services and a variety of bus services are available in Jacksonville. Bus service is also available in Macclenny. One railroad system provides freight transportation for Baker County. Commercial air passenger service is available at the nearby Jacksonville International Airport.

Geomorphology

Paulette A. Bond, Florida Department of Natural Resources, Florida Geological Survey, Bureau of Geology, prepared this section and the sections on stratigraphy, hydrogeology, and mineral resources.

Baker County is in the Proximal or Northern Zone *(36)*. This zone includes the western panhandle of Florida and extends to the east coast. The southern boundary extends from the vicinity of Adams Beach in Taylor County to the boundary between St. Johns and Flagler Counties. Baker County has two subzones, which are differentiated on the basis of topographic elevations. Most of Baker County is in the Northern Highlands subzone, but a small area adjacent to Nassau and Duval Counties is in the Atlantic Coastal Lowlands subzone. Figure 3 shows geologic cross sections in Baker County, and figures 4 and 5 illustrate the underlying stratigraphy of these cross sections.

Northern Highlands

The Northern Highlands subzone extends east across northern Florida from the western boundary with Alabama to Trail Ridge. This province extends north into Alabama and Georgia. It is bordered on the south and east by the Cody Scarp, a persistent and

Figure 2.—A golf course in an area of Troup-Bonneau-Penney complex, 5 to 8 percent slopes.

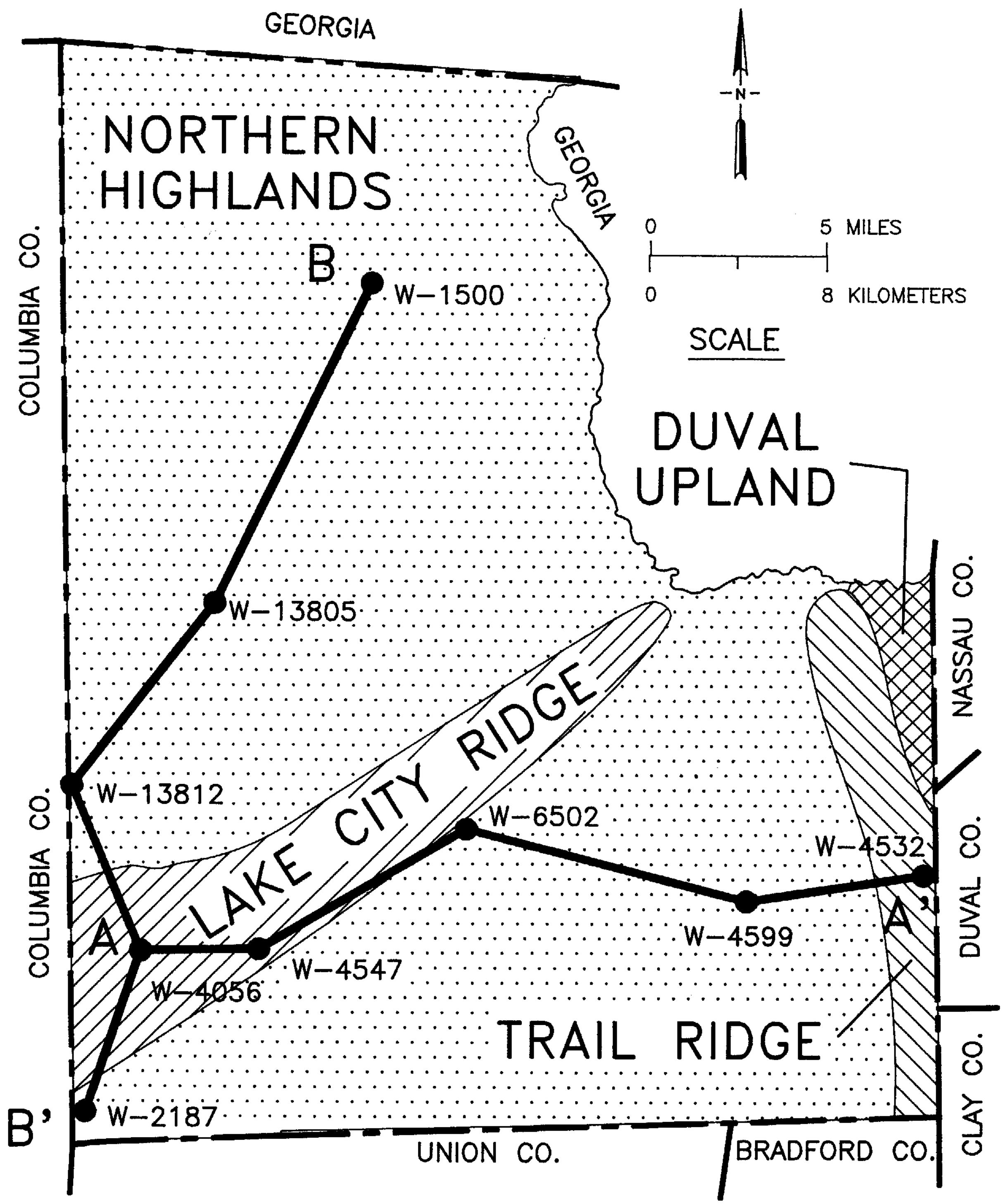

Figure 3.—Geologic cross sections in Baker County, Florida.

continuous slope that is broken only by the valleys of major streams *(20)*. In Baker County the elevation of the Northern Highlands ranges from approximately 95 to 200 feet above mean sea level. The province is underlain by Miocene sand, clay, dolomite, and limestone. Miocene deposits are overlain by locally thick

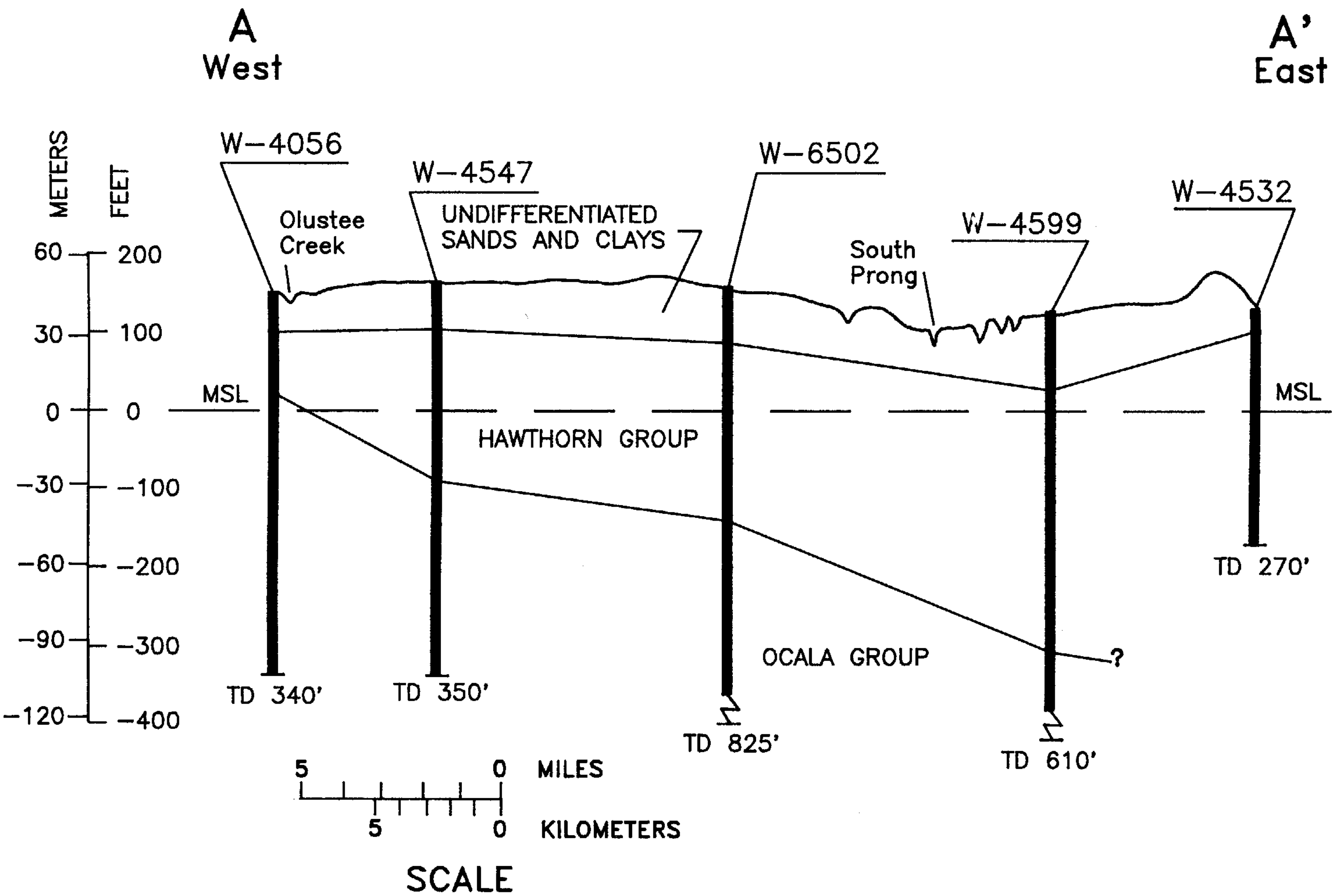

Figure 4.—Geologic cross section A-A′ in Baker County. The numbers preceded by "W" are well numbers. "TD" means total depth, and "MSL" means mean sea level.

deposits of quartz sands that contain varying amounts of clay *(13)*. Baker County includes the Trail Ridge and Lake City Ridge geomorphic subdivisions of the Northern Highlands *(20)*.

Trail Ridge.—Trail Ridge is a linear ridge that roughly parallels the present Atlantic coastline *(20)*. It is narrow in Baker County but becomes more broad to the south. It is in southeastern Baker County near the boundaries with Nassau and Duval Counties. Elevations of the Trail Ridge range from 100 to 200 feet. The feature is underlain by quartz sand, which contains clay and organic material as well as heavy minerals *(13)*. Originally, Trail Ridge may have been a barrier island during a time when sea level was higher than it is presently *(36)*.

Lake City Ridge.—Lake City Ridge is a prominent topographic feature that is geographically related to Trail Ridge. Reportedly, it intersects Trail Ridge *(9)*, but a map of geomorphologic features does not show this intersection *(7)*. The difference in interpretations may be related to differing definitions for the boundaries of the ridges. Elevations of the Lake City Ridge range from 150 to 215 feet and are similar to those associated with Trail Ridge.

Atlantic Coastal Lowlands

The Atlantic Coastal Lowlands geomorphic subzone includes the land adjacent to the Atlantic coastline of Florida *(20)*. This area is low in elevation and generally is poorly drained. The geomorphic features that characterize the Atlantic Coastal Lowlands are underlain by a mixture of Miocene clay, sand, dolomite, and limestone. The Miocene lithologies are blanketed by varying amounts of Pleistocene quartz sand and clay

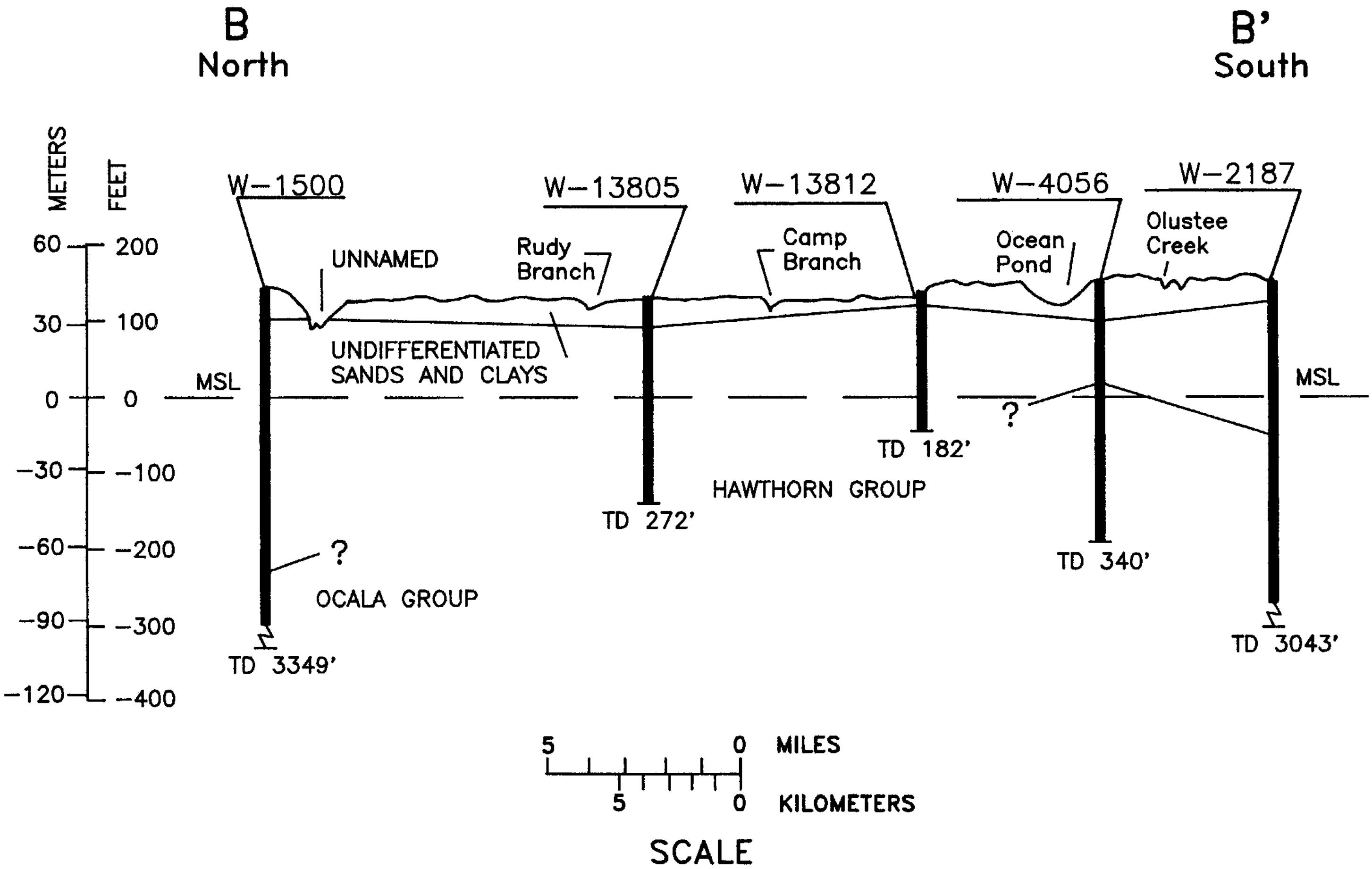

Figure 5.—Geologic cross section B-B′ in Baker County. The numbers preceded by "W" are well numbers. "TD" means total depth, and "MSL" means mean sea level.

(15). Because the geomorphic features of the Atlantic Coastal Lowlands roughly parallel the present Atlantic coastline, their origin may be related to marine processes. The Atlantic Coastal Lowlands includes a number of geomorphic subdivisions. Only one of these subdivisions, the Duval Upland, occurs in Baker County.

Duval Upland.—The Duval Upland *(20)* is in southeastern Baker County adjacent to the boundary of Baker and Nassau Counties. It is bordered on the west by Trail Ridge. It is part of a larger landform that parallels the coast and extends eastward into Nassau and Duval Counties. The very small part of this feature that occurs in Baker County ranges in elevation from approximately 50 to 100 feet and is characterized by medium or fine sand and clayey sand *(15)*.

Stratigraphy

According to the Florida Geological Survey, the oldest rocks penetrated by water wells in Baker County are limestones of the Eocene age that are included in the Ocala Group. The youngest sediments are undifferentiated surficial quartz sands and clayey sands of Pleistocene and Holocene age *(16)*. The limestones of the Ocala Group and the younger overlying limestone and siliciclastic (sandstone, silt, and clay) units are important freshwater aquifers. The following description of the geology of Baker County is limited to sediments of Eocene age and younger.

Eocene Series

Ocala Group.—Marine limestones of the Ocala Group *(19)* underlie all of Baker County *(16)*. The Ocala Group is made up of, in ascending order, the Inglis Formation, the Williston Formation, and the Crystal River Formation. These formations are generally differentiated on the basis of lithology and fossil content. In Baker County, however, they consist of a fairly homogeneous sequence of cream to light gray, medium soft, chalky to granular marine limestones that contain thin beds of hard, massive dolomitic limestone and dolomite *(16)*. Foraminifera, bryozoan fragments, and whole and broken echinoids are the most abundant fossil types in sediments in the Ocala Group. The thickness of the Ocala Group in the vicinity of Baker County ranges from approximately 220 to 310 feet. It averages about 250 feet. Depth to the top of the Ocala Group ranges from approximately 200 to 500 feet. In Baker County the upper surface of the Ocala Group dips to the northeast *(16)*.

Oligocene Series

Suwannee Limestone.—The Suwannee Limestone unconformably overlies the limestone of the Ocala Group in the southwestern part of Baker County *(16)*. It consists of light gray to white, granular limestone which contains yellowish brown, indurated siltstone and sandstone cemented with calcium carbonate. It is less than 30 feet thick in Baker County and occurs at a depth of approximately 180 feet. The unit does not occur in many parts of the county. It may not have been deposited in these areas, or it may have been removed by erosion before the deposition of the overlying Hawthorn Group *(16)*.

Miocene Series

Hawthorn Group.—The Hawthorn Group unconformably overlies the Ocala Group limestones or the Suwannee Limestone in Baker County *(16)*. In northern Florida the Hawthorn Group is made up of, in ascending order, the Penney Farms Formation, the Marks Head Formation, the Coosawhatchie Formation, and the Statenville Formation *(22)*. Within Baker County the Coosawhatchie Formation may contain the Charlton Member *(13, 22)*. In much of Baker County, the Hawthorn Group is not differentiated into its component formations. Few cores are available, and cores are required in order for the formations to be identified. Lithologically, the undifferentiated Hawthorn Group consists of interbedded quartz sand, clay, and dolostone. The quartz sand varies in color from yellowish gray to light gray. It is poorly indurated and contains varying amounts of clay, dolostone, and phosphate. The clay is yellowish gray to light olive gray and contains sand, dolomite, and phosphate. It is poorly indurated or moderately indurated. The dolostone is light gray to olive gray and contains sand, clay, and phosphate. It is poorly indurated to well indurated and has fossil molds scattered throughout *(13)*. The undifferentiated Hawthorn Group ranges from approximately 125 to 350 feet in thickness *(22)*. Depth to the top of the Hawthorn Group ranges from approximately 20 to 170 feet. If core data of good quality are available, the Hawthorn Group may be differentiated into its constituent formations *(22)*. In Baker County, data have been collected from a core of the Coosawhatchie Formation *(13)*. This formation consists mainly of quartz sand that has lesser amounts of dolomite and limestone. In places it contains a recognizable subunit, the Charlton Member. The Charlton Member in Baker County is sandy limestone and calcareous, clayey quartz sand with common mollusk molds. The Charlton Member is restricted to the southeastern part of Baker County. It lies at the top of the Coosawhatchie Formation and ranges from less than 1 foot to about 20 feet in thickness. In Baker County the Charlton Member is at a depth of about 160 feet *(13)*. The Statenville Formation consists of interbedded phosphatic sands, dolostones, and clays and may extend into northwestern Baker County *(22)*.

Undifferentiated Post-Miocene Sediments

The upper surface of the Hawthorn Group in Baker County is blanketed by deposits of unconsolidated and poorly consolidated quartz sand that contains varying amounts of clay. According to the Florida Geological Survey, these sandy deposits generally range from about 20 to 100 feet in thickness in the Northern Highlands area of Baker County. Sandy deposits in the vicinity of Trail Ridge and the Lake City Ridge are thicker than those in the Northern Highlands. A thickness of 162 feet is observed in a well in Baker County that completely penetrates the post-Miocene sequence *(13)*. The thickness of sands in the Duval Upland in Baker County cannot be documented because data are not available for wells in that area. Sand in the Northern Highlands is fine grained or medium grained and has only trace amounts of heavy minerals *(13)*. In contrast, sand in the Trail Ridge area is characteristically fine grained to coarse grained and has common heavy minerals and organic matter. Sand in the Northern Highlands is mixed with clay, but sand in the Trail Ridge area is mixed with clay or is in discrete, scattered clay beds *(13)*.

Hydrogeology

Ground water fills the pore spaces and voids in subsurface rocks and sediments. Most of the ground water in Baker County comes from rainfall and the downward seepage of water from surface streams and marshes. Ground water is drawn from ground-water aquifers. In order of increasing depth, the main aquifer systems under Baker County are the surficial aquifer system, the intermediate aquifer system, and the Floridan aquifer system *(24, 16)*.

Surficial Aquifer System

The surficial aquifer system *(24)* in Baker County includes upper Miocene sediments of the Hawthorn Group and post-Miocene sediments that are not differentiated in this report. These sediments range from approximately 30 to 150 feet in thickness, but the permeable beds of the aquifer generally are within the upper 50 feet of the deposits *(16)*. These permeable sand and shell beds are not continuous and tend to form lenses that are bounded by less permeable silty clay beds. The surficial aquifer system is recharged mainly by rainfall and the downward seepage of water from surface streams and marshes. Water is discharged from the aquifer through evapotranspiration and seepage into streams, lakes, and swamps if their water levels are lower than the water level in the aquifer *(16)*. Discharge also occurs through downward movement or percolation into the lower aquifers and through pumping from wells in the county. Water from the surficial aquifer system may be high in iron. The iron content stains plumbing fixtures and causes bad-tasting water. Generally, the water is used for rural domestic uses and for livestock and irrigation because it is relatively inexpensive to acquire *(16)*.

Intermediate Aquifer System

The intermediate aquifer system *(24)* in Baker County is made up of comparatively thin, discontinuous lenses of sand, shell, and carbonate. These permeable lenses occur within the relatively impermeable beds of clay and clayey sand in the Hawthorn Group. The impermeable beds are referred to as the intermediate confining unit *(24)*. Clay beds and beds of clayey sand may restrict the vertical movement of water so that the water exists under artesian pressure within some permeable layers *(16)*. These permeable lenses have a varying rate of occurrence in Baker County. Their location cannot be predicted. The intermediate aquifer system is recharged by the downward movement of water from the shallow aquifer system. Wells that penetrate the intermediate aquifer system generally yield more water that has a lower iron content than wells penetrating the shallow system. Water from the intermediate aquifer system is used for domestic, livestock, and irrigation supplies *(16)*.

Floridan Aquifer System

The Floridan aquifer system supplies most of the water in northeastern Florida and southeastern Georgia. In Baker County this aquifer system is mainly made up of permeable limestone and dolomite of Eocene age. In some areas of the county, Suwannee Limestone of Late Oligocene age and limestone beds of the Hawthorn Group of Miocene age may also be a part of the Floridan aquifer system *(16)*. The Floridan aquifer system underlies all of Baker County. Its upper surface ranges from approximately 50 feet below mean sea level in the western part of the county to more than 350 feet in the eastern part. The thickness of the Floridan aquifer system throughout Baker County is not known, but it is more than 1,600 feet thick in the southwestern part and about 1,900 feet thick in the northeastern part *(16)*. The relatively impermeable sediments of the Hawthorn Group confine the Floridan aquifer system in Baker County. The aquifer system is recharged primarily in areas where the intermediate confining unit is thin or breached by streams or sinkholes. In these areas water may move downward into the aquifer system. Water from the Floridan aquifer system is discharged by upward seepage and also from wells *(16)*.

Mineral Resources

Currently, no mineral commodities are commercially mined in Baker County *(8, 25)*. Clayey sands of post-Miocene age have some potential for use as fill material. Limestone is deeply buried by post-Miocene clayey sands and also by the siliciclastics and discontinuous dolostones and limestones of Miocene age. The existence of peat deposits is suggested by extensive wetland areas in northern Baker County, but no data are currently available to document their occurrence *(5)*. Phosphate and heavy minerals are not currently being mined in Baker County, but future development of these resources is possible.

Phosphate

Baker County is in the Northern and Northeast Florida Phosphate Districts *(8)*. Phosphate production in northern Florida is from the Statenville Formation of the Hawthorn Group and is restricted to eastern Hamilton County, which is in the Northern District *(22)*. The Statenville Formation may occur in a very limited area of northwestern Baker County. Eastern Baker County is in the Northeast District that has phosphate at a depth of approximately 200 feet *(22)*. Phosphate is currently not mined in Baker County, probably because of the economic factors related to the thickness of overburden as well as the relative enrichment of phosphate within the rock units that contain it. Commercial exploitation of this resource may become an option in the future as alternate phosphate resources dwindle and technology improves. The U.S. Geological Survey evaluated impacts associated with potential phosphate mining on the hydrology of the Osceola National Forest in a study conducted in 1978 *(17)*.

Heavy Minerals

The ore body at the southern end of Trail Ridge in Bradford and Clay Counties is mined commercially for heavy minerals. A core drilled on Trail Ridge in Baker County was found to have an ore zone approximately 35 feet thick *(18)*. Heavy minerals from the ore zone include leucoxene and ilmenite. They are intermixed with quartz sand, silt, clay, and organic matter *(18)*.

How This Survey Was Made

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

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

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under the headings "General Soil Map Units" and "Detailed Soil Map Units."

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

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

Soil Classification and Soil Mapping

After describing the soils in a survey area and measuring or characterizing their properties, soil scientists systematically classify the soils into taxonomic classes that have a specified range of characteristics. The system of taxonomic classification used for soils in the United States, described in "Soil Taxonomy" *(26)*, has categories that are based mainly on the kind and character of soil properties and the arrangement of soil horizons within the profile. Once the individual soils in a survey area are classified, they can be compared and correlated with similar soils in the same taxonomic class that have been recognized in other areas.

Soils occur on the landscape in an orderly pattern that is related to the geology, the landforms, and the vegetation. 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, the soil scientists can develop a concept, or model, of how the soils formed. During mapping, this model enables the soil scientists to predict with a considerable degree of accuracy the location of specific soils on the landscape.

Individual soils on the landscape commonly merge into one another as their characteristics gradually change. To construct an accurate soil map, the soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Compared to the whole three-dimensional soil volume, the areas examined are little more than points. These few observations, however, 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. The delineated map units are based on inferences derived from this small sample.

A ground-penetrating radar (GPR) system and hand transects were used to document the type and variability of the soils occurring in the map units *(10, 11, 14, 23)*. The GPR system was used successfully on all soils to measure the depth to and determine the variability of major soil horizons or other soil features. In this survey 235 random transects were made by GPR or by hand. Information from notes and ground-truth observations made in the field were used, along with radar data, to classify the soils and to determine the composition of map units. The map units described in the section "Detailed Soil Map Units" are based on these data.

Soil Variability and 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 two or three 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. These areas of differing soils are called inclusions.

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 referred to as similar inclusions. Their properties are noted in the description of the dominant soil or soils. Some inclusions have properties and behavior different enough to affect use or require different management. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The dissimilar inclusions 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 soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil survey. 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.

Confidence Limits of Soil Survey Information

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, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

Confidence limits in soil surveys are statistical expressions of the probability that a soil property or the composition of a map unit will vary within prescribed limits. These limits can be assigned numerical values based on a random sample. In the absence of specific data for determining confidence limits, the natural variability of soils and the way soil surveys are made must be considered. The composition of map units and other information are derived largely from extrapolations made from a small sample. Also, information about the soils does not extend below a depth of about 6 feet. The information in the soil survey is not meant to be used as a substitute for onsite investigation. Soil survey information can be used to select from among alternative practices or general designs that may be needed to minimize the possibility of soil-related failures. It cannot be used to interpret specific points on the landscape.

Specific confidence limits for the composition of map units in this survey area were determined by random transects made by ground-penetrating radar or by hand across mapped areas. The data are given in the description of each soil under the heading "Detailed Soil Map Units." Soil scientists made enough transects and took enough samples to characterize each map unit at a specific confidence level. For example, map unit 23 was characterized at a 95 percent confidence level based on transect data. The composition is described as follows: "On 95 percent of the acreage mapped as Leon sand, Leon and similar soils make up 90 to 100 percent of the mapped areas." On the other 5 percent of the acreage, the percentage of Leon and similar soils may be lower than 90 percent.

The composition of some map units in the survey area, such as miscellaneous areas, was determined on the basis of the judgment of the soil scientist rather than by a statistical procedure.

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, it 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 another but in a different pattern.

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

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or 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.

Soils on Narrow to Broad Ridges and Isolated Knolls

These soils are somewhat poorly drained and nearly level or gently sloping. They are sandy to a depth of 20 or more inches and have loamy material within a depth of 80 inches. They occur along the St. Mary's River and its tributaries.

1. Leefield-Albany-Ocilla

Nearly level or gently sloping, somewhat poorly drained soils that are sandy to a depth of 20 or more inches and have loamy material within a depth of 80 inches

The soils in this map unit are on narrow to broad ridges and isolated knolls. Areas of this map unit generally are near Cedar Creek and the south, middle, and north prongs of the St. Mary's River. Individual areas are small or medium sized and are elongated.

This map unit makes up about 23,970 acres, or slightly more than 6 percent of the acreage in the county. It is about 25.5 percent Leefield soils, 23 percent Albany soils, 19 percent Ocilla soils, and 32.5 percent soils of minor extent.

Typically, Leefield soils have a surface layer of dark gray fine sand about 10 inches thick. The subsurface layer, to a depth of about 28 inches, is pale yellow fine sand and yellow loamy fine sand. The upper part of the subsoil, to a depth of 35 inches, is brownish yellow fine sandy loam. The next part, to a depth of about 58 inches, is light brownish gray sandy clay loam. The lower part to a depth of 80 inches or more is reticulately mottled sandy clay loam.

Typically, Albany soils have a surface layer of dark grayish brown fine sand about 8 inches thick. The subsurface layer, to a depth of 59 inches, is light yellowish brown and pale yellow fine sand over brownish yellow loamy fine sand. The subsoil to a depth of 80 inches or more is gray fine sandy loam and sandy clay loam.

Typically, Ocilla soils have a surface layer of dark gray fine sand about 9 inches thick. The upper part of the subsurface layer, to a depth of about 22 inches, is very pale brown fine sand. The lower part, to a depth of 26 inches, is yellow fine sand. The upper part of the subsoil, to a depth of 32 inches, is light grayish brown fine sandy loam. The next part, to a depth of 41 inches, is light brownish gray sandy clay loam. The lower part to a depth of 80 inches or more is gray sandy clay loam.

Of minor extent in this map unit are Blanton, Bonneau, Duplin, Hurricane, Kershaw, Mulat, Olustee, Ortega, Pamlico, Pelham, Penney, Plummer, Ridgewood, Sapelo, Surrency, and Troup soils. Blanton, Bonneau, Kershaw, Ortega, Penney, and Troup soils are in the highest positions on the landscape. Duplin, Hurricane, and Ridgewood soils are in landscape positions similar to those of the major soils. Olustee, Pamlico, Pelham, and Sapelo soils are in the lower positions on the landscape. Surrency and Mulat soils are on the flood plains.

Most areas of this map unit are used for urban development or farming. Some areas support natural vegetation and planted trees. Seasonal wetness can affect production of deep-rooted crops, but it can be easily overcome by bedding.

The natural vegetation consists of longleaf pine, slash pine, and water oak. The understory includes turkey oak, live oak, gallberry, pineland threeawn (wiregrass), and bluestem.

Soils in the Flatwoods

These soils are somewhat poorly drained to very poorly drained and are nearly level. They are mostly sandy to a depth of 20 or more inches. Some of the soils are loamy throughout but have a surface layer of muck.

2. Mascotte-Pantego-Sapelo

Nearly level, poorly drained and very poorly drained soils that are sandy to a depth of 20 or more inches or are loamy throughout but have a thin surface layer of muck

The soils in this map unit are in the flatwoods. Areas of this unit are throughout the county. The individual areas vary in shape and are small to very large in size. The landscape is characterized by depressions and broad, low flats.

This map unit makes up about 170,400 acres, or slightly more than 45 percent of the acreage in the county. It is about 42 percent Mascotte soils, 21 percent Pantego soils, 15 percent Sapelo soils, and 22 percent soils of minor extent.

Mascotte soils are poorly drained. Typically, the surface layer is black fine sand about 7 inches thick. The subsurface layer, to a depth of about 18 inches, is light gray fine sand. The upper part of the subsoil, to a depth of 24 inches, is black and dark reddish brown fine sand. The next part, to a depth of 29 inches, is light yellowish brown fine sand. Below this, to a depth of 38 inches, is an intervening layer of fine sand. The lower part of the subsoil is gray fine sandy loam and grayish brown loamy fine sand. The underlying material to a depth of 80 inches or more is grayish brown loamy fine sand.

Pantego soils are very poorly drained. Typically, the surface layer is black muck, black mucky fine sandy loam, and very dark gray fine sandy loam about 26 inches thick. The subsoil to a depth of 80 inches or more is light brownish gray sandy clay loam.

Sapelo soils are poorly drained. Typically, the surface layer is very dark gray fine sand about 6 inches thick. The subsurface layer, to a depth of about 18 inches, is light gray fine sand. The upper part of the subsoil, to a depth of 31 inches, is black, dark reddish brown, and yellowish brown fine sand. Below this, to a depth of 48 inches, is an intervening layer of light gray fine sand. The lower part of the subsoil, to a depth of 70 inches, is light gray fine sandy loam and sandy clay. The underlying material to a depth of 80 inches or more is light gray fine sandy loam.

Of minor extent in this map unit are Duplin, Leefield, Ocilla, Olustee, Pamlico, Pelham, Plummer, and Rains soils. Duplin, Leefield, and Ocilla soils are in the higher positions on the landscape, and Pamlico soils are in the lowest positions.

Most areas of this map unit support planted trees. Some areas are used for urban development.

The natural vegetation in the flatwoods is slash pine. The understory consists dominantly of saw palmetto and pineland threeawn (wiregrass). The vegetation in the depressions is cypress, blackgum, loblolly-bay, sweetbay, redbay, red maple, pond pine, and myrtleleaf holly.

3. Pelham-Pantego-Ocilla

Nearly level, poorly drained, very poorly drained, and somewhat poorly drained soils that are sandy to a depth of 20 or more inches and have loamy material within a depth of 40 inches or are loamy throughout but have a thin surface layer of muck

The soils in this map unit are on broad, low flats characterized by scattered depressions (fig. 6). Areas of this unit are in the eastern part of the county.

This map unit makes up about 69,660 acres, or slightly less than 19 percent of the acreage in the county. It is about 46 percent Pelham soils, 12 percent Pantego soils, 10 percent Ocilla soils, and 32 percent soils of minor extent.

Pelham soils are poorly drained. Typically, the surface layer is black and very dark gray fine sand about 6 inches thick. The subsurface layer, to a depth of about 26 inches, is light brownish gray fine sand. The subsoil to a depth of 80 inches or more is gray fine sandy loam and sandy clay loam.

Pantego soils are very poorly drained. Typically, the surface layer is black muck, black mucky fine sandy loam, and very dark gray fine sandy loam about 26 inches thick. The subsoil to a depth of 80 inches or more is light brownish gray sandy clay loam.

Ocilla soils are somewhat poorly drained. Typically, the surface layer is dark gray fine sand about 9 inches thick. The upper part of the subsurface layer, to a depth of about 22 inches, is very pale brown fine sand. The lower part, to a depth of 26 inches, is yellow loamy fine sand. The upper part of the subsoil, to a depth of 32 inches, is light brownish gray fine sandy loam. The next part, to a depth of 41 inches, is light brownish gray sandy clay loam. The lower part to a depth of 80 inches or more is gray sandy clay loam.

Of minor extent in this map unit are Duplin, Leefield, Mascotte, Olustee, Pamlico, Plummer, Rains, and Sapelo soils. Duplin and Leefield soils are in the higher positions on the landscape.

Most areas of this map unit support planted trees. Some areas are used for urban development.

The natural vegetation on the broad, low flats and in

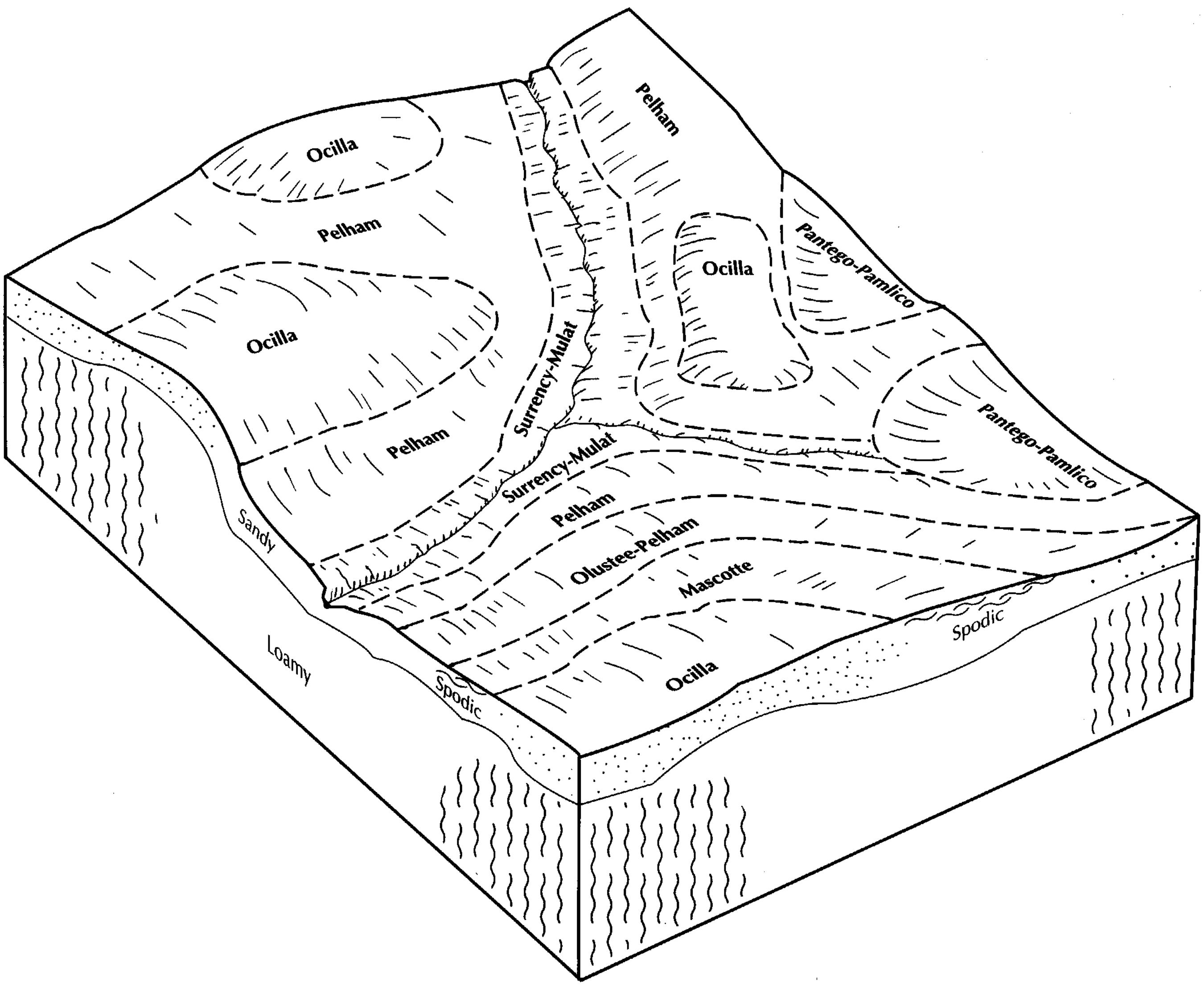

Figure 6.—Pattern of soils and parent material in the Pelham-Pantego-Ocilla and Osier-Surrency-Mulat general soil map units.

sloughs is slash pine. The understory consists of gallberry, scattered saw palmetto, bluestem, and pineland threeawn (wiregrass). The vegetation in the depressions is cypress, blackgum, loblolly-bay, sweetbay, redbay, red maple, pond pine, and myrtleleaf holly.

4. Leon-Pottsburg-Boulogne

Nearly level, poorly drained and somewhat poorly drained, sandy soils

The soils in this unit are in the flatwoods. Areas of this map unit are in the eastern part of the county and along a ridge extending from near Olustee east-northeast to an area between Cedar Creek and the south prong of the St. Mary's River. Individual areas are elongated and large. The landscape is characterized by nearly level flatwoods intermixed with cypress ponds and drainageways (figs. 7 and 8).

This map unit makes up about 44,570 acres, or about 12 percent of the acreage in the county. It is about 51 percent Leon soils, 20 percent Pottsburg soils, 8 percent Boulogne soils, and 21 percent soils of minor extent.

Leon soils are poorly drained. Typically, the surface layer is dark gray and black sand about 7 inches thick.

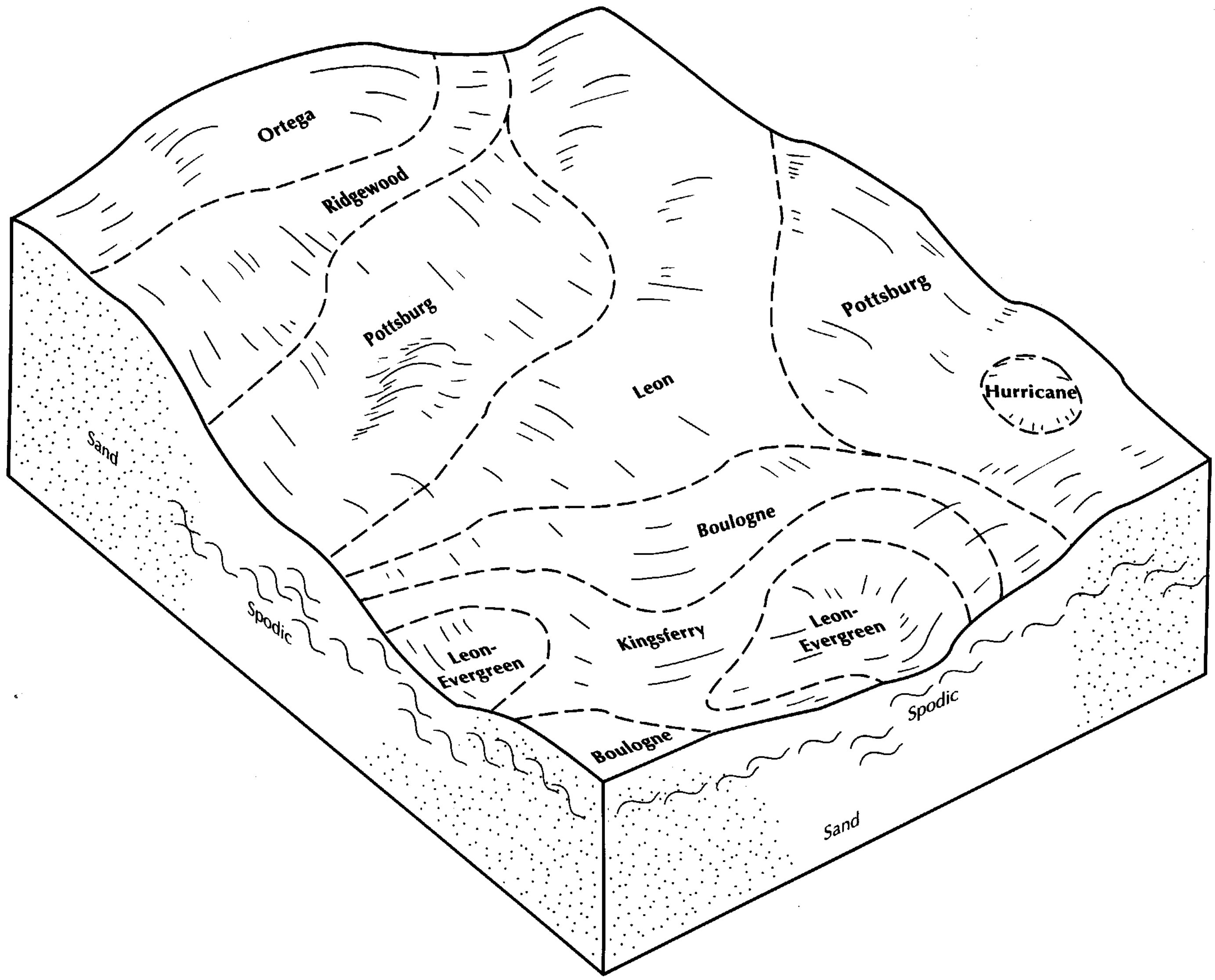

Figure 7.—Pattern of soils and parent material in an area of the Leon-Pottsburg-Boulogne general soil map unit on Trail Ridge.

The subsurface layer, to a depth of about 17 inches, is light gray sand. The upper part of the subsoil, to a depth of 23 inches, is dark reddish brown loamy sand. Below this is 3 inches of very dark grayish brown sand. The next part, to a depth of 31 inches, is yellowish brown sand. Below this, to a depth of 47 inches, is an intervening layer of light gray sand. The lower part of the subsoil to a depth of 80 inches or more is black sand.

Pottsburg soils are poorly drained and somewhat poorly drained. Typically, the surface layer is black and very dark gray sand about 8 inches thick. The subsurface layer, to a depth of 53 inches, is dark gray, light gray, and brown sand. The subsoil to a depth of 80 inches or more is black sand.

Boulogne soils are poorly drained. Typically, the surface layer is very dark gray sand about 6 inches thick. The upper part of the subsoil, to a depth of 11 inches, is dark brown sand. The next part, to a depth of 38 inches, is grayish brown fine sand, light grayish brown sand, and light gray fine sand. The lower part to a depth of 80 inches or more is dark brown and dark reddish brown fine sand that has an intervening layer of pinkish gray fine sand over black fine sand.

Of minor extent in this map unit are Evergreen, Hurricane, Kingsferry, Ortega, Mandarin, and

Ridgewood soils. Hurricane, Mandarin, Ortega, and Ridgewood soils are in the higher positions on the landscape, and Evergreen and Kingsferry soils are in the lower positions.

Most areas of this map unit support planted trees. Some areas are used for urban development.

The natural vegetation in the flatwoods is mixed longleaf pine and slash pine. The understory consists dominantly of saw palmetto, gallberry, pineland threeawn (wiregrass), and bluestem. The vegetation in the cypress ponds and drainageways is dominantly pond pine, cypress, blackgum, loblolly-bay, sweetbay, redbay, red maple, and myrtleleaf holly.

Soils in Swamps and on Flood Plains

These soils are poorly drained and very poorly drained and are level or nearly level. Some have an organic layer 16 to 51 inches thick underlain by sandy material. Some have a dark, loamy subsoil within a depth of 30 inches. Some are organic throughout, and

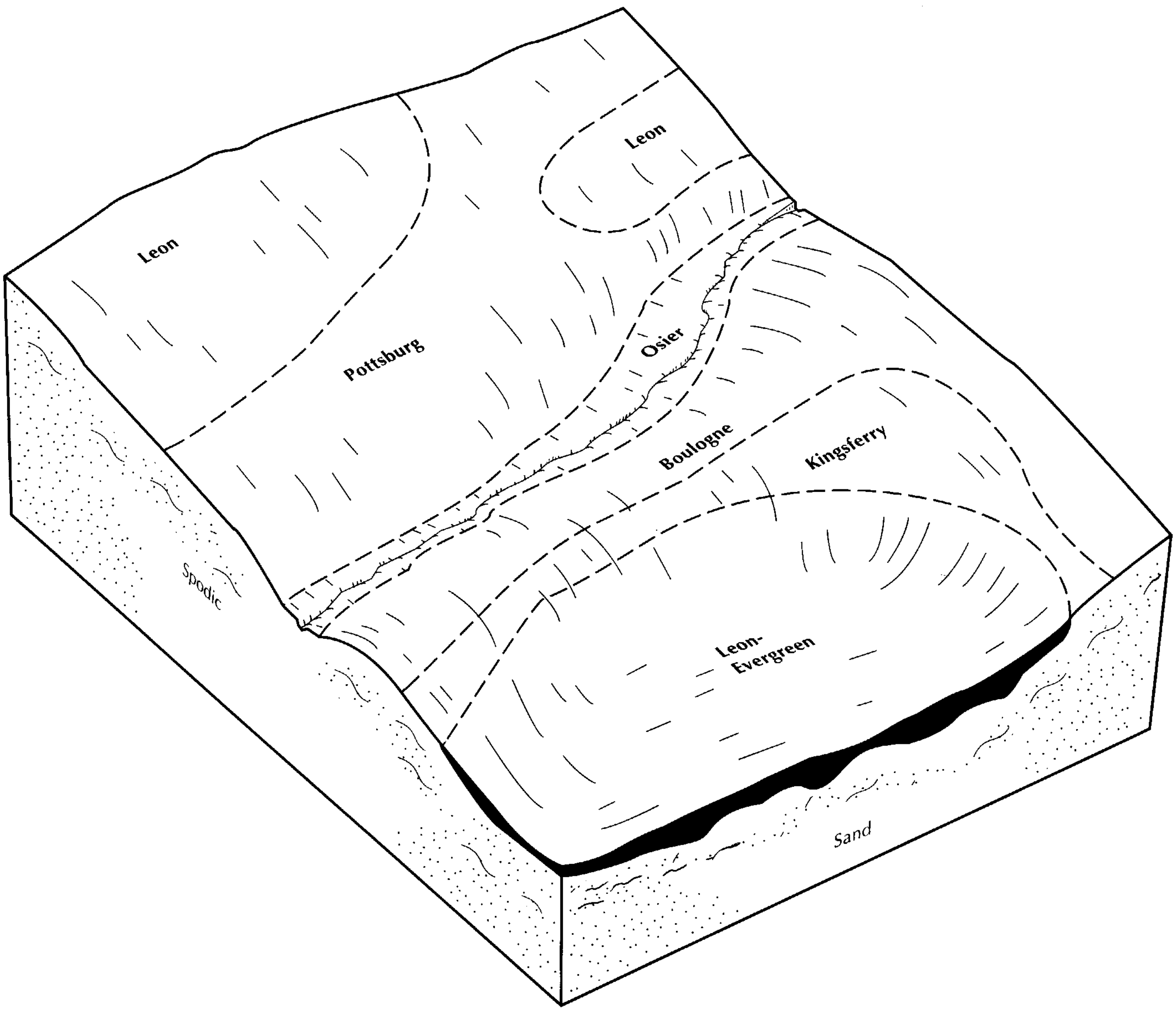

Figure 8.—Pattern of soils and parent material in the Leon-Pottsburg-Boulogne and Osier-Surrency-Mulat general soil map units.

some are sandy throughout. The soils are in swamps throughout the county. The largest area is in Pinhook Swamp and along the tributaries of the St. Mary's River.

5. Pamlico-Mascotte-Dasher

Level and nearly level, very poorly drained and poorly drained soils that are organic over sandy or loamy material, are sandy material more than 24 inches thick over a sandy or loamy subsoil, or are organic throughout and are frequently ponded

This map unit is in swamps in the southern and northern parts of the county. The landscape is characterized by large, low swamps that are under water for long periods.

This map unit makes up about 58,795 acres, or slightly less than 16 percent of the acreage in the county. It is about 43 percent Pamlico soils, 23 percent Mascotte soils, 6 percent Dasher soils, and 28 percent soils of minor extent.

Pamlico soils are very poorly drained. Typically, the surface layer is black muck to a depth of about 18 inches. The underlying material extends to a depth of 70 inches or more. In sequence downward, it is 4 inches of black mucky fine sand, 8 inches of grayish brown fine sand, 12 inches of dark gray loamy fine sand, 13 inches of dark gray sandy clay loam, and 15 or more inches of dark grayish brown loamy fine sand.

Mascotte soils are poorly drained. Typically, the surface layer is black fine sand about 6 inches thick. The subsurface layer, to a depth of 18 inches, is light gray fine sand. The subsoil extends to a depth of 80 inches or more. In sequence downward, it is 6 inches of black and dark reddish brown fine sand, 14 inches of yellowish brown and light gray fine sand, 14 inches of gray fine sandy loam, and 28 or more inches of grayish brown loamy fine sand and fine sand.

Dasher soils are very poorly drained. Typically, they are black muck to a depth of 80 inches or more.

Of minor extent in this map unit are Pelham, Plummer, and Sapelo soils in the flatwoods.

This map unit supports natural vegetation. Natural vegetation in the swamps consists of hardwoods, including sweetbay, cypress, slash pine, and pond pine. The understory includes gallberry, swamp cyrilla, greenbrier, fetterbush lyonia, and myrtleleaf holly.

6. Osier-Surrency-Mulat

Nearly level, poorly drained and very poorly drained soils that are sandy throughout or are sandy to a depth of 20 or more inches and have loamy material within a depth of 40 inches

The soils in this map unit are in swamps along the St. Mary's River and its tributaries. Individual areas are mostly narrow and elongated (figs. 6 and 8). The landscape is characterized by nearly smooth to slightly undulating, elevated ridges and flood plains. The areas are interspersed with swamps, depressions, oxbows, slight knolls, or small bluffs adjoining the St. Mary's River. Extreme variations in the water level of the St. Mary's River affect the water table in the soils.

This map unit makes up about 7,114 acres, or about 2 percent of the acreage in the county. It is about 49 percent Osier soils, 35 percent Surrency soils, 14 percent Mulat soils, and 2 percent soils of minor extent.

Osier soils are poorly drained. Typically, the surface layer is very dark gray fine sand about 6 inches thick. The underlying material to a depth of 80 inches or more is light brownish gray and white fine sand.

Surrency soils are very poorly drained. Typically, the surface layer is 8 inches of black mucky fine sand over 20 inches of black and very dark gray fine sand. The subsoil to a depth of 80 inches or more is light brownish gray fine sandy loam and sandy clay loam.

Mulat soils are poorly drained. Typically, the surface layer is very dark gray mucky fine sand about 8 inches thick. The subsurface layer, to a depth of about 31 inches, is dark gray fine sand. The subsoil, to a depth of about 57 inches, is dark gray sandy clay loam. The underlying material to a depth of 80 inches or more is dark gray fine sand.

Of minor extent in this map unit are Kingsferry, Leon, and Ousley soils. These minor soils are in positions on the landscape similar to those of the major soils.

This map unit supports natural vegetation. The natural vegetation is dominantly pond pine, baldcypress, water tupelo, sweetgum, and water oak and an understory of saw palmetto, gallberry, waxmyrtle, and bluestem. The slightly elevated ridges support slash pine, loblolly pine, and longleaf pine and scattered blackjack oak, turkey oak, post oak, willow oak, and red maple and an understory of gallberry, saw palmetto, running oak, pineland threeawn (wiregrass), and bluestem.

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 the heading "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, 0 to 5 percent slopes, is a phase of 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. Surrency-Mulat complex, frequently flooded, 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. Hurricane and Ridgewood soils, 0 to 5 percent slopes, 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. The map unit "Pits" is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Advances in soil science and changes in series concepts have occurred since the soil survey of the Osceola National Forest was completed in 1973. Therefore, some of the map unit delineations from the earlier survey do not agree with those of the present survey. These differences do not affect the use and management of the soils.

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.

3—Pits. This map unit consists of excavations from which soil and other geologic material have been removed for use in road construction, foundations, septic tank absorption fields, or other purposes. The excavations have short, steep side slopes. Most of the pits are abandoned. They are locally referred to as borrow pits. Most are less than 10 acres in size, but a few are more than 20 acres in size. Areas that have been excavated below the normal water table usually contain water.

This map unit is not associated with or confined to a particular kind of soil. It does not have an orderly sequence of soil layers. The soils in the pits are variable, but they usually include the subsoil and substratum of surrounding soils.

No capability subclass is assigned.

6—Blanton fine sand, moderately wet, 0 to 5 percent slopes. This moderately well drained, nearly level or gently sloping soil is on narrow to broad ridges and isolated knolls. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark grayish brown fine sand about 8 inches thick. The subsurface layer, to a depth of about 73 inches, is light yellowish brown, yellow, brownish yellow, and white fine sand and loamy fine sand. The subsoil to a depth of 80 inches or more is light gray sandy clay loam.

On 92 percent of the acreage mapped as Blanton fine sand, moderately wet, 0 to 5 percent slopes, Blanton and similar soils make up 80 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 20 percent.

Included in mapping are Blanton soils that have a water table below a depth of 48 inches.

Dissimilar soils that are included with the Blanton soil in mapping occur as small areas of Albany and Ocilla soils. These soils are in positions on the landscape similar to those of the Blanton soil. They generally are in areas less than 3 acres in size.

Permeability is moderate in the Blanton soil. Available water capacity is low. In most years the seasonal high water table is at a depth of 30 to 48 inches, except during dry periods. In some years, during wet periods, it is at a depth of 18 to 30 inches for as long as 2 weeks.

This soil is in the Mixed Hardwood and Pine ecological community *(30)*. This community is dominated by bluejack oak, southern red oak, laurel oak, and live oak and has common slash pine, loblolly pine, and longleaf pine. Other common trees include sweetgum, black cherry, hickory, and water oak. Common understory plants are hawthorn, blackberry, sparkleberry, American beautyberry, waxmyrtle, blueberry, wild plum, and sassafras. Common herbaceous plants, vines, and grasses include wild grape, greenbriers, yellow jessamine, trumpet creeper, broomsedge bluestem, and wiregrass. Quantities and types of vegetation can vary greatly, depending on the successional stage. In the climax stage, which has a closed canopy dominated by oaks, understory vegetation may be quite sparse.

The potential productivity of this soil for pine trees is high. Slash pine, loblolly pine, and longleaf pine are suitable for planting. Site preparation, such as harrowing, helps to establish seedlings. Chopping reduces debris, controls competing vegetation, and facilitates planting. Using planting stock that is larger than usual or that is containerized can reduce the seedling mortality rate. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is moderately suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderate yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is moderately suited to cultivated crops. Droughtiness and low fertility are limitations affecting most crops. Irrigation is needed during dry periods. Residue management, including conservation tillage, conserves moisture during dry periods and helps to control erosion. Lime and fertilizer should be applied according to the needs of the crop.

This soil is moderately suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table and a poor filtering capacity are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed. If the density of housing is moderate or high, a community sewage system can prevent the contamination of ground water resulting from seepage.

The capability subclass is IIIs. The woodland ordination symbol is 11S.

7—Troup-Bonneau-Penney complex, 5 to 8 percent slopes. These moderately well drained to excessively drained, moderately sloping soils are on upland side slopes. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are concave or convex.

Typically, the surface layer of the Troup soil is grayish brown fine sand about 9 inches thick. The subsurface layer, to a depth of about 55 inches, is light yellowish brown fine sand. The subsoil is strong brown fine sandy loam to a depth of 64 inches and red sandy clay loam to a depth of 80 inches or more.

Typically, the surface layer of the Bonneau soil is dark grayish brown fine sand about 5 inches thick. The subsurface layer, to a depth of about 26 inches, is light yellowish brown fine sand. The subsoil is yellowish brown fine sandy loam to a depth of 31 inches, yellowish brown sandy clay loam to a depth of 44 inches, reticulately mottled sandy clay loam to a depth of 70 inches, and reticulately mottled fine sandy loam to a depth of 80 inches or more.

Typically, the surface layer of the Penney soil is dark gray fine sand about 2 inches thick. The subsurface layer, to a depth of 50 inches, is yellowish brown and light yellowish brown fine sand. The subsoil to a depth of 80 inches or more is pale brown and light yellowish brown fine sand that has strong brown lamellae.

On 77 percent of the acreage mapped as Troup-Bonneau-Penney complex, 5 to 8 percent slopes, Troup, Bonneau, Penney, and similar soils make up 67 to 100 percent of the mapped areas. Generally, the mapped areas are about 42 percent Troup and similar soils, 22 percent Bonneau and similar soils, and 13 percent Penney and similar soils. Dissimilar soils make up 0 to 33 percent. On 23 percent of the acreage, the dissimilar soils make up more than 33 percent of the mapped areas.

Soils that are similar to the Troup, Bonneau, and Penney soils are included in mapping. These are Ortega soils and soils that have slopes of as much as 12 percent.

Dissimilar soils that are included with the Troup, Bonneau, and Penney soils in mapping occur as small areas of Albany, Duplin, and Ridgewood soils. These dissimilar soils are in positions on the landscape similar to those of the Troup, Bonneau, and Penney soils. They generally are in areas less than 3 acres in size.

The components of this map unit occur as areas so intricately intermingled that it is not practical to map them separately at the scale used in mapping. The proportions and patterns of the Troup, Bonneau, and Penney soils and of the similar soils are relatively consistent in most mapped areas.

Permeability is moderate in the Troup and Bonneau soils and rapid in the Penney soil. Available water capacity is low in the Troup and Bonneau soils and very low in the Penney soil. The seasonal high water table is at a depth of more than 72 inches in the Troup and Penney soils. It is at a depth of 48 to 60 inches in the Bonneau soil, except during dry periods in early spring and late fall.

This map unit is in the Mixed Hardwood and Pine or Longleaf Pine-Turkey Oak Hills ecological community *(30)*. The Mixed Hardwood and Pine community is in the moderately well drained areas. It has native vegetation dominated by bluejack oak, southern red oak, laurel oak, and live oak and has common slash pine, longleaf pine, or loblolly pine. Other common trees include sweetgum, black cherry, hickory, and water oak. The Longleaf Pine-Turkey Oak Hills community is in the excessively drained areas. It is dominated by longleaf pine, turkey oak, bluejack oak, and sand post oak. Understory plants include Adam's needle, coontie, coralbean, pricklypear, shining sumac, yaupon, blazing star, partridge pea, yellow indiangrass, and dropseed.

The potential productivity of these soils for pine trees is high. Slash pine, loblolly pine, and longleaf pine are suitable for planting. Site preparation, such as harrowing, helps to establish seedlings. Chopping reduces debris, controls competing vegetation, and facilitates planting. Using planting stock that is larger than usual or that is containerized can reduce the seedling mortality rate. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Fire lanes and access roads that slope gently to streams reduce the hazard of soil erosion. Water bars, water turnouts, and broad-based dips are needed to direct water and sediments away from roads and streams. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

These soils are moderately suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderate yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

These soils are poorly suited to cultivated crops. The slope, droughtiness, and low fertility are limitations affecting most crops.

These soils are well suited to moderately suited to septic tank absorption fields and to dwellings without basements. In some areas the slope, a poor filtering capacity, and the seasonal high water table are management concerns. If the Bonneau soil is used as a site for septic tank absorption fields, mounding may be needed. If the density of housing is moderate or high, a community sewage system can prevent the contamination of ground water resulting from seepage.

The capability subclass is IVs. The woodland ordination symbol is 11S for the Troup and Bonneau soils and 5S for the Penney soil.

8—Blanton fine sand, 0 to 5 percent slopes. This moderately well drained, nearly level or gently sloping soil is on narrow to broad ridges and isolated knolls. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is grayish brown fine sand about 7 inches thick. The subsurface layer, to a depth of about 43 inches, is light yellowish brown fine sand. The subsoil to a depth of 80 inches or more is brownish yellow loamy fine sand that grades to light yellowish brown fine sandy loam and light brownish gray sandy clay loam.

On 83 percent of the acreage mapped as Blanton fine sand, 0 to 5 percent slopes, Blanton and similar soils make up 80 to 90 percent of the mapped areas. Dissimilar soils make up 10 to 20 percent. On 17 percent of the acreage, the dissimilar soils make up less than 10 percent or more than 20 percent of the mapped areas.

Soils that are similar to the Blanton soil are included in mapping. These are Bonneau soils, Blanton soils that are moderately wet, and soils that have a surface layer less than 6 inches thick.

Dissimilar soils that are included with the Blanton soil in mapping occur as small areas of Troup soils. These soils are well drained and are on side slopes. They are generally in areas less than 3 acres in size.

Permeability is moderate or moderately slow in the Blanton soil. Available water capacity is low. In most years the seasonal high water table is at a depth of 48 to 72 inches during wet periods. In some years it is at a depth of 36 to 48 inches for as long as 2 weeks.

This soil is in the Longleaf Pine-Turkey Oak Hills ecological community *(30)*. This community is dominated by longleaf pine, turkey oak, bluejack oak, and sand post oak. Common shrubs include Adam's needle, coontie, coralbean, shining sumac, and yaupon. Pricklypear, partridge pea, blazing star, elephants-foot, grassleaf goldaster, yellow indiangrass, and dropseed are also common.

The potential productivity of this soil for pine trees is high. Slash pine, loblolly pine, and longleaf pine are suitable for planting. Site preparation helps to establish seedlings. Chopping reduces debris, controls competing vegetation, and facilitates planting. Using planting stock that is larger than usual or that is containerized can reduce the seedling mortality rate. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is moderately suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderate yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is moderately suited to cultivated crops. Droughtiness and low fertility are limitations affecting most crops. Irrigation is needed during dry periods. Residue management, including conservation tillage, conserves moisture during dry periods and helps to control erosion. Lime and fertilizer should be applied according to the needs of the crop.

This soil is moderately suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table is the main limitation. If the soil is used as a site for septic tank absorption fields, mounding may be needed.

The capability subclass is IIIs. The woodland ordination symbol is 11S.

11—Boulogne sand. This poorly drained, nearly level soil is in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is very dark gray sand about 6 inches thick. The upper part of the subsoil, to a depth of about 11 inches, is dark brown sand. Below this, to a depth of 38 inches, is grayish brown fine sand, light brownish gray sand, and light gray fine sand. The lower part of the subsoil to a depth of 80 inches or more is dark brown and dark reddish brown fine sand that has an intervening layer of pinkish gray fine sand underlain by black fine sand.

On 95 percent of the acreage mapped as Boulogne sand, Boulogne and similar soils make up 80 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 20 percent. On 5 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas.

Included in mapping are areas of soils that are similar to the Boulogne soil. The dark upper part of the subsoil in these soils is 16 to 23 inches thick. In the Lake City Ridge area, the Boulogne soil is fine sand, but in the Trail Ridge area it is dominantly sand.

Dissimilar soils that are included with the Boulogne soil in mapping occur as small areas of Allanton, Evergreen, Kingsferry, Leon, Pottsburg, and Murville soils. Allanton, Kingsferry, and Murville soils are in the lower positions on the landscape. Evergreen and Leon soils are in small depressions. Pottsburg soils are in positions on the landscape similar to or slightly higher than those of the Boulogne soil. These dissimilar soils are generally in areas less than 3 acres in size.

Permeability is slow in the Boulogne soil. Available water capacity is moderate. In most years the seasonal high water table is at a depth of 6 to 18 inches during wet periods.

This soil is in the North Florida Flatwoods ecological community *(30)*. This community is generally dominated by slash pine. The understory includes saw palmetto, gallberry, and grasses. Scattered water oak and laurel oak and several species of blueberry and waxmyrtle also are common. Chalky bluestem, broomsedge bluestem, lopsided indiangrass, low panicums, and wiregrass are the more common grasses. Other common plants include grassleaf goldaster, blackberry, brackenfern, deer tongue, gayfeather, milkwort, and a variety of seed-producing legumes.

The potential productivity of this soil for pine trees is high. Slash pine, loblolly pine, and longleaf pine are suitable for planting. Site preparation, such as bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks and harvesting during dry periods help to overcome the equipment limitation and minimize soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderately good yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is moderately suited to cultivated crops. The seasonal high water table, low fertility, and droughtiness are limitations affecting most crops. A drainage system is needed to remove excess water. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table and the slow permeability are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed. If the density of housing is moderate or high, a community sewage system can prevent the contamination of ground water resulting from seepage.

The capability subclass is IIIw. The woodland ordination symbol is 11W.

16—Dasher mucky peat, depressional. This very poorly drained, nearly level soil is in depressions. Individual areas are circular or oblong and range from about 10 to more than 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, this soil is black mucky peat to a depth of 80 inches or more.

On 94 percent of the acreage mapped as Dasher mucky peat, depressional, Dasher and similar soils make up 80 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 20 percent. On 6 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas.

Small areas of Pamlico soils are included in mapping. These soils are similar to the Dasher soil.

Dissimilar soils that are included with the Dasher soil in mapping occur as small areas of Mascotte soils. These soils are in positions on the landscape similar to those of the Dasher soil. They are generally in areas less than 3 acres in size.

Permeability is moderately rapid in the Dasher soil. Available water capacity is very high. The seasonal high water table is usuallly at the surface or 1 to 2 feet above the surface. The water table is slightly below the surface during dry periods.

This soil is in the Scrub Bog-Bay Swamp ecological community *(30)*. This community is dominated by gallberry, fetterbush lyonia, myrtleleaf holly, swamp cyrilla, greenbriers, sweet pepperbush, and sweetbay and has scattered slash pine and pond pine. Cinnamon fern, maidencane, and sphagnum moss commonly grow in open areas. Scrub bogs are predominantly dense masses of evergreen shrubs that seldom exceed 25 feet in height. Bay swamps are forested wetlands dominated by one or two species of evergreen trees. The bay swamps are climax communities that have mature trees. The scrub bogs are in the earlier stages of plant succession. Some areas of scrub bogs remain in the subclimax stage because of periodic fire. The shrubs have many stems and thick foliage and commonly appear impenetrable. Common herbaceous plants and vines include wild grape, greenbriers, and poison ivy. Other plants include maidencane, cinnamon fern, and sphagnum moss.

This soil is not suited to pasture, cultivated crops, or the production of planted pine trees because of ponding and the seasonal high water table.

This soil is not suited to septic tank absorption fields or to dwellings without basements because of the ponding and subsidence.

The capability subclass is VIIw. No woodland ordination symbol is assigned.

17—Dorovan muck, frequently flooded. This very poorly drained, nearly level soil is on the flood plains. Individual areas are elongated and range from about 10 to more than 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, this soil is black muck to a depth of 80 inches or more.

On 91 percent of the acreage mapped as Dorovan muck, frequently flooded, Dorovan and similar soils make up 80 to 100 percent of the mapped areas.

Dissimilar soils make up 0 to 20 percent. On 9 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas.

Small areas of Pamlico soils are included in mapping. These soils are similar to the Dorovan soil.

Dissimilar soils that are included with the Dorovan soil in mapping occur as small areas of Surrency soils. These soils are in positions on the landscape similar to those of the Dorovan soil. They are generally in areas less than 3 acres in size.

Permeability is moderate in the Dorovan soil. Available water capacity is very high. In most years the seasonal high water table is slightly above the surface or within a depth of 12 inches during wet periods. Flooding occurs several times during most years in winter and summer.

This soil is in the Swamp Hardwoods ecological community *(30)*. This community is dominated by blackgum, red maple, ogeechee lime, cypress, and bay trees. Common shrubs include fetterbush lyonia, Virginia willow, buttonbush, and waxmyrtle. Common herbaceous plants and vines include wild grape, greenbriers, and poison ivy. Other plants include maidencane, cinnamon fern, and sphagnum moss.

This soil is not suited to the production of planted pine trees because of wetness and flooding. A drainage system is not practical.

This soil is not suited to pasture or cultivated crops because of the flooding and the seasonal high water table.

This soil is not suited to septic tank absorption fields or to dwellings without basements because of the flooding and subsidence.

The capability subclass is VIIw. The woodland ordination symbol is 7W.

18—Surrency-Mulat complex, frequently flooded. These very poorly drained and poorly drained, nearly level soils are on the flood plains. Individual areas are elongated and range from about 10 to more than 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer of the Surrency soil is about 28 inches thick. The upper part is black mucky fine sand. The lower part is black and very dark gray fine sand. The subsoil to a depth of 80 inches or more is light brownish gray fine sandy loam and sandy clay loam.

Typically, the surface layer of the Mulat soil is very dark gray mucky fine sand about 6 inches thick. The subsurface layer, to a depth of about 28 inches, is gray fine sand. The subsoil, to a depth of about 55 inches, is dark gray sandy clay loam. The underlying material to a depth of 80 inches or more is dark gray loamy fine sand.

On 92 percent of the acreage mapped as Surrency-Mulat complex, frequently flooded, Surrency, Mulat, and similar soils make up 80 to 100 percent of the mapped areas. Dissimilar soils make up 10 to 20 percent. On 8 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas. Generally, the mapped areas are about 59 percent Surrency and similar soils and 33 percent Mulat and similar soils.

Small areas of soils that are similar to the Surrency and Mulat soils are included in mapping. These are Pelham soils; soils that have a black and very dark gray surface layer but have a sandy texture below the loamy subsoil and above a depth of 60 inches; and soils that have a layer of organic material more than 10 inches thick over the black and very dark gray surface layer.

Dissimilar soils that are included with the Surrency and Mulat soils in mapping occur as small areas of Osier, Pamlico, and Pottsburg soils. Pottsburg and Osier soils are at the edges of the mapped areas. Pamlico soils are in positions on the landscape similar to those of the Surrency and Mulat soils. The dissimilar soils are generally in areas less than 3 acres in size.

The components of this map unit occur as areas so intricately intermingled that it is not practical to map them separately at the scale used in mapping. The proportions and patterns of the Surrency and Mulat soils and of the similar soils are relatively consistent in most mapped areas.

Permeability is moderate in the Surrency soil and slow or moderately slow in the Mulat soil. Available water capacity is moderate in both soils. In most years the seasonal high water table is within a depth of 6 inches during wet periods. Flooding occurs during most years in winter and summer.

These soils are in the Swamp Hardwoods ecological community *(30)*. This community is dominated by blackgum, red maple, ogeechee lime, cypress, and bay trees. Common shrubs include fetterbush lyonia, Virginia willow, buttonbush, and waxmyrtle. Common herbaceous plants and vines include wild grape, greenbriers, and poison ivy. Other plants include maidencane, cinnamon fern, and sphagnum moss.

These soils are not suited to the production of planted pine trees. The major management concerns are flooding and the seasonal high water table. A drainage system is not practical.

These soils are not suited to pasture or cultivated crops because of the flooding and the seasonal high water table.

These soils are not suited to septic tank absorption fields or to dwellings without basements because of the flooding and the seasonal high water table.

The capability subclass is Vw. The woodland ordination symbol is 7W.

20—Duplin loamy fine sand, 2 to 5 percent slopes. This moderately well drained, gently sloping soil is on narrow ridges and isolated knolls bordering drainageways. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is very dark grayish brown loamy fine sand about 4 inches thick. The subsurface layer, to a depth of about 10 inches, is dark brown loamy fine sand. The subsoil to a depth of about 70 inches is yellowish brown sandy clay loam, yellowish brown clay, light brownish gray sandy clay, and reticulately mottled, brown sandy clay.

On 95 percent of the acreage mapped as Duplin loamy fine sand, 2 to 5 percent slopes, Duplin and similar soils make up 86 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 14 percent. On 5 percent of the acreage, the dissimilar soils make up more than 14 percent of the mapped areas.

Included in mapping are soils that are similar to the Duplin soil but have a substratum of loamy fine sand and sandy loam within a depth of 60 inches.

Dissimilar soils that are included with the Duplin soil in mapping occur as small areas of Leefield, Ocilla, Pelham, and Rains soils. These soils are in the lower positions on the landscape. They are generally in areas less than 3 acres in size.

Permeability is moderately slow in the Duplin soil. Available water capacity is moderate. In most years the seasonal high water table is at a depth of 24 to 36 inches during wet periods. In some years, during wet periods, it is at a depth of 18 to 24 inches for as long as 2 weeks.

This soil is in the Mixed Hardwood and Pine ecological community *(30)*. This community is dominated by bluejack oak, southern red oak, laurel oak, and live oak and has common slash pine, loblolly pine, and longleaf pine. Other common trees include sweetgum, black cherry, hickory, and water oak. Common understory plants are hawthorn, blackberry, sparkleberry, American beautyberry, waxmyrtle, blueberry, wild plum, and sassafras. Common herbaceous plants, vines, and grasses include wild grape, greenbriers, yellow jessamine, trumpet creeper, broomsedge bluestem, and wiregrass. Quantities and types of vegetation can vary greatly, depending on the successional stage. In the climax stage, which has a closed canopy dominated by oaks, understory vegetation may be quite sparse.

The potential productivity of this soil for pine trees is high. Loblolly pine and slash pine are suitable for planting. Site preparation, such as harrowing, helps to establish seedlings. Chopping reduces debris, controls competing vegetation, and facilitates planting. Using planting stock that is larger than usual or that is containerized can reduce the seedling mortality rate. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderate yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is moderately well suited to cultivated crops. The erosion hazard and low fertility are limitations affecting most crops. Irrigation is needed in some years. Residue management, including conservation tillage, conserves moisture during dry periods and helps to control erosion. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table, a high shrink-swell potential, and the slow permeability are the main limitations. If the soil is used as a site for septic tank absorption fields, mounding may be needed.

The capability subclass is IIe. The woodland ordination symbol is 9W.

21—Hurricane and Ridgewood soils, 0 to 5 percent slopes. These somewhat poorly drained, nearly level or gently sloping soils are on narrow to broad ridges and isolated knolls in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer of the Hurricane soil is dark gray and dark grayish brown sand about 8 inches thick. The subsurface layer, to a depth of about 63 inches, is light yellowish brown and white sand. The subsoil to a depth of 80 inches or more is brown and very dark gray sand.

Typically, the surface layer of the Ridgewood soil is dark gray fine sand about 4 inches thick. The underlying material to a depth of 80 inches or more is brown, olive yellow, pale yellow, and light gray fine sand.

Generally, the mapped areas are about 53 percent Hurricane and similar soils and 35 percent Ridgewood and similar soils. Some areas are made up of Hurricane and similar soils, some are made up of Ridgewood and similar soils, and some are made up of both soils. The relative proportion of the combinations of the soils varies. Areas of the individual soils are large enough to map separately, but because of present and predicted use they were mapped as one unit.

On 80 percent of the acreage mapped as Hurricane and Ridgewood soils, 0 to 5 percent slopes, Hurricane, Ridgewood, and similar soils make up 80 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 20 percent. On 8 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas.

Included in mapping are soils that are similar to the Hurricane and Ridgewood soils but have a subsurface layer that is 66 to 75 inches thick. In the Lake City Ridge area, the Hurricane and Ridgewood soils are fine sand, but in the Trail Ridge area they are dominantly sand.

Dissimilar soils that are included with the Hurricane and Ridgewood soils in mapping occur as small areas of Albany, Boulogne, Mandarin, Ortega, and Pottsburg soils. Ortega soils are in the higher positions on the landscape. Boulogne, Mandarin, and Pottsburg soils are in the lower positions on the landscape. Albany soils are in positions on the landscape similar to those of the Hurricane and Ridgewood soils. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderately rapid in the Hurricane soil and rapid in the Ridgewood soil. Available water capacity is low in both soils. In most years the seasonal high water table is at a depth of 24 to 42 inches, except during dry periods. In some years, during wet periods, it is at a depth of 12 to 24 inches for as long as 2 weeks.

These soils are in the Longleaf Pine-Turkey Oak Hills ecological community *(30)*. This community is dominated by longleaf pine, turkey oak, bluejack oak, and sand post oak. Common shrubs include Adam's needle, coontie, coralbean, shining sumac, and yaupon. Pricklypear, partridge pea, blazing star, elephants-foot, grassleaf goldaster, yellow indiangrass, and dropseed are common.

The potential productivity of these soils for pine trees is high. Slash pine, longleaf pine, and loblolly pine are suitable for planting. Site preparation, such as harrowing and bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

These soils are moderately suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderate yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

These soils are moderately suited to cultivated crops. Droughtiness and low fertility are limitations affecting most crops. Irrigation is needed during dry periods. Residue management, including conservation tillage, conserves moisture during dry periods and helps to control erosion. Lime and fertilizer should be applied according to the needs of the crop.

These soils are poorly suited to septic tank absorption fields and moderately suited to dwellings without basements. The seasonal high water table and a poor filtering capacity are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed. If the density of housing is moderate or high, a community sewage system can prevent the contamination of ground water resulting from seepage.

The capability subclass is IIIw. The woodland ordination symbol is 11W for the Hurricane soil and 10W for the Ridgewood soil.

22—Leefield fine sand, 0 to 5 percent slopes. This somewhat poorly drained, nearly level or gently sloping soil is on narrow to broad ridges and isolated knolls in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark gray fine sand about 10 inches thick. The subsurface layer, to a depth of about 28 inches, is pale yellow fine sand and yellow loamy fine sand. The subsoil is light brownish gray fine sandy loam to a depth of 35 inches, light brownish gray sandy clay loam to a depth of 58 inches, and reticulately mottled sandy clay loam to a depth of 80 inches or more.

On 93 percent of the acreage mapped as Leefield fine sand, 0 to 5 percent slopes, Leefield and similar soils make up 80 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 20 percent. On 7 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas.

Soils that are similar to the Leefield soil are included in mapping. These are Albany and Ocilla soils and Blanton soils that are moderately wet. Blanton soils are in the higher positions on the landscape. Also included in mapping are soils that have a water table at a lower depth than that in the Leefield soil and soils in which the surface layer is 4 to 7 inches thick.

Dissimilar soils that are included with the Leefield soil in mapping occur as small areas of Duplin and Pelham soils. Duplin soils are near drainageways. Pelham soils are in the lower positions on the landscape. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderately slow in the Leefield soil. Available water capacity is low. In most years the seasonal high water table is at a depth of 18 to 30 inches, except during dry periods. In some years, during wet periods, it is at a depth of 12 to 18 inches for as long as 2 weeks.

This soil is in the Mixed Hardwood and Pine ecological community *(30)*. This community is dominated by bluejack oak, southern red oak, laurel oak, and live oak and has frequent slash pine, loblolly pine, and longleaf pine. Other common trees include sweetgum, black cherry, hickory, and water oak. Common understory plants are hawthorn, blackberry, sparkleberry, American beautyberry, waxmyrtle, blueberry, wild plum, and sassafras. Common herbaceous plants, vines, and grasses include wild grape, greenbriers, yellow jessamine, trumpet creeper, broomsedge bluestem, and wiregrass. Quantities and types of vegetation can vary greatly, depending on the successional stage. In the climax stage, which has a closed canopy dominated by oaks, understory vegetation may be quite sparse.

The potential productivity of this soil for pine trees is high. Slash pine, loblolly pine, and longleaf pine are suitable for planting. Site preparation, such as harrowing and bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderate yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is moderately well suited to cultivated crops (fig. 9). Droughtiness and low fertility are limitations affecting most crops. Irrigation is needed during extended dry periods. Residue management, including conservation tillage, conserves moisture during dry periods and helps to control erosion. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and is moderately suited to dwellings without basements. The seasonal high water table and the slow permeability are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed.

The capability subclass is IIw. The woodland ordination symbol is 11W.

23—Leon sand. This poorly drained, nearly level soil is in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is dark gray and black sand about 7 inches thick. The subsurface layer, to a depth of about 17 inches, is light gray sand. The upper part of the subsoil, to a depth of 31 inches, is dark reddish brown, very dark grayish brown, and yellowish brown loamy sand. Below this, to a depth of 47 inches, is an intervening layer of light gray sand. The lower part of the subsoil to a depth of 80 inches or more is black sand.

On 95 percent of the acreage mapped as Leon sand, Leon and similar soils make up 90 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 10 percent. On 5 percent of the acreage, the dissimilar soils make up more than 10 percent of the mapped areas.

Soils that are similar to the Leon soil are included in mapping. These are Boulogne soils and soils in which the subsoil is below a depth of 30 inches. In the Lake City Ridge area, the Leon soil is fine sand, but in the Trail Ridge area it is dominantly sand.

Dissimilar soils that are included with the Leon soil in mapping occur as small areas of Allanton, Evergreen, Hurricane, Kingsferry, Mandarin, Osier, and Pottsburg soils. Hurricane soils are in the higher positions on the landscape. Allanton and Kingsferry soils are in the lower positions on the landscape. Pottsburg soils are in landscape positions similar to or higher than those of the Leon soil. Evergreen soils are in small depressions. Osier soils are on flood plains. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderately rapid or moderate in the Leon soil. Available water capacity is low. The seasonal high water table is within a depth of 12 inches, except during dry periods.

This soil is in the North Florida Flatwoods ecological community *(30)*. This community is dominated by laurel oak and water oak and has scattered longleaf pine, loblolly pine, and slash pine. Other common trees include sweetgum, hickory, wild cherry, magnolia, and

Figure 9.—Corn and beans in an area of Leefield fine sand, 0 to 5 percent slopes.

flowering dogwood. Common shrubs are sparkleberry, American beautyberry, saw palmetto, and waxmyrtle. Common herbaceous plants, vines, and grasses are greenbriers, wild grape, trumpet creeper, crossvine, yellow jessamine, low panicums, switchgrass, and broomsedge bluestem.

The potential productivity of this soil for pines is moderately high. Slash pine and longleaf pine are suitable for planting. Site preparation, such as bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks and harvesting during dry periods help to overcome the equipment limitation and minimize soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderately good yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is poorly suited to cultivated crops. The seasonal high water table, low fertility, and droughtiness are limitations affecting most crops. A drainage system is needed to remove excess water. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table and a poor filtering capacity are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed. If the density of housing is moderate or high, a community sewage system can prevent the contamination of ground water resulting from seepage.

The capability subclass is IVw. The woodland ordination symbol is 8W.

24—Leon-Evergreen complex, depressional. These very poorly drained, nearly level soils are in depressions in the flatwoods. Individual areas are circular or oblong and range from about 10 to more than 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the upper part of the surface layer of the Leon soil is dark reddish brown muck about 5 inches thick. The lower part, to a depth of about 14 inches, is black fine sand. The subsurface layer, to a depth of 26 inches, is light gray sand. The subsoil is dark reddish brown loamy sand to a depth of 31 inches, dark brown sand to a depth of 57 inches, dark dusky red loamy sand to a depth of 69 inches, and black loamy fine sand to a depth of 80 inches or more.

Typically, the surface layer of the Evergreen soil is black muck about 14 inches thick. It is underlain by 8 inches of black fine sand. The subsurface layer, to a depth of about 40 inches, is dark gray, gray, and brown fine sand. The subsoil to a depth of 65 inches or more is dark brown and dark reddish brown fine sand.

On 95 percent of the acreage mapped as Leon-Evergreen complex, depressional, Leon, Evergreen, and similar soils make up 75 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 30 percent. On 5 percent of the acreage, the dissimilar soils make up more than 25 percent of the mapped areas. Generally, the mapped areas are about 67 percent Leon and similar soils and 28 percent Evergreen and similar soils.

Small areas of soils that are similar to the Leon soil are included in mapping. These are Murville soils and soils having a surface layer that is 18 to 20 inches thick. Also included in mapping are Pamlico soils, which are similar to the Evergreen soil.

Dissimilar soils that are included with the Leon and Evergreen soils in mapping occur as small areas of Allanton, Boulogne, Kingsferry, Osier, and Pottsburg soils. Allanton, Boulogne, Kingsferry, and Pottsburg soils are along the edges of the mapped areas. Osier soils are in positions on the landscape similar to those of the Leon and Evergreen soils. The dissimilar soils are generally in areas less than 3 acres in size.

The components of this map unit occur as areas so intricately intermingled that it is not practical to map them separately at the scale used in mapping. The proportions and patterns of the Leon and Evergreen soils and of the similar soils are relatively consistent in most mapped areas.

Permeability is moderately rapid or moderate in the Leon and Evergreen soils. Available water capacity is low or moderate. The seasonal high water table is at the surface or 1 to 2 feet above the surface. The water table is slightly below the surface during dry periods.

These soils are in the Swamp Hardwoods ecological community *(30)*. This community is dominated by blackgum, red maple, ogeechee lime, cypress, and bay trees. Common shrubs include fetterbush lyonia, Virginia willow, buttonbush, and waxmyrtle. Common herbaceous plants and vines include wild grape, greenbriers, and poison ivy. Other plants include maidencane, cinnamon fern, and sphagnum moss.

These soils are not suited to pasture, cultivated crops, or the production of pine trees because of ponding and the seasonal high water table.

These soils are not suited to septic tank absorption fields or to dwellings without basements because of the ponding and the seasonal high water table.

The capability subclass is VIIw. The woodland ordination symbol is 2W.

25—Kershaw sand, 2 to 5 percent slopes. This excessively drained, gently sloping soil is on high, broad ridges in the uplands. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark grayish brown sand about 3 inches thick. The underlying material to a depth of 80 inches or more is yellowish brown, brownish yellow, and yellow sand.

On 88 percent of the acreage mapped as Kershaw sand, 2 to 5 percent slopes, the Kershaw soil makes up 80 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 20 percent. On 12 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas.

Dissimilar soils that are included with the Kershaw soil in mapping occur as small areas of Ortega soils. These soils are in the lower positions on the landscape. They are generally in areas less than 3 acres in size.

Permeability is very rapid in the Kershaw soil. Available water capacity is very low. The seasonal high water table is at a depth of more than 72 inches.

This soil is in the Longleaf Pine-Turkey Oak Hills ecological community *(30)*. This community is dominated by longleaf pine, turkey oak, bluejack oak, and sand post oak. Common shrubs include Adam's needle, coontie, coralbean, shining sumac, and yaupon. Pricklypear, partridge pea, blazing star, elephants-foot, grassleaf goldaster, yellow indiangrass, and dropseed are also common.

The potential productivity of this soil for pine trees is low. Sand pine and longleaf pine are suitable for planting. Site preparation, such as chopping, reduces debris, controls competing vegetation, and facilitates planting. Using planting stock that is larger than usual or that is containerized can reduce the seedling mortality rate. Natural regeneration may be preferable. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is poorly suited to tame pasture grasses and is unsuited to cultivated crops because of droughtiness and low fertility.

This soil is well suited to septic tank absorption fields and to dwellings without basements. If the soil is used as a site for septic tank absorption fields, the very rapid permeability may cause pollution of ground water in areas where the density of housing is high.

The capability subclass is VIIs. The woodland ordination symbol is 3S.

26—Kingsferry and Allanton soils. These very poorly drained, nearly level soils are on broad, low flats in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer of the Kingsferry soil is black and very dark gray fine sand about 34 inches thick. The subsoil is dark brown fine sand to a depth of about 43 inches, very dark gray fine sand to a depth of 54 inches, and black fine sand to a depth of 80 inches or more.

Typically, the surface layer of the Allanton soil is black and very dark gray fine sand about 22 inches thick. The subsurface layer, to a depth of about 60 inches, is dark gray and gray fine sand. The subsoil to a depth of 80 inches or more is dark reddish brown fine sand.

Generally, the mapped areas are about 76 percent Kingsferry and similar soils and 21 percent Allanton and similar soils. Some areas are made up of Kingsferry and similar soils, some are made up of Allanton and similar soils, and some are made up of both soils. The relative proportion of the combinations of the soils varies. Areas of the individual soils are large enough to map separately, but because of present and predicted use they were mapped as one unit.

On 80 percent of the acreage mapped as Kingsferry and Allanton soils, Kingsferry, Allanton, and similar soils make up 90 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 20 percent. On 3 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas.

Small areas of soils that are similar to the Kingsferry and Allanton soils are included in mapping. These are Murville soils, soils that are similar to the Kingsferry soil but are on seepage slopes along the St. Mary's River, soils that have a stained organic layer below a depth of 50 inches, and soils that have a thin transitional layer of loamy fine sand with streaks of fine sandy loam just above the black subsoil layer.

Dissimilar soils that are included with the Kingsferry and Allanton soils in mapping occur as small areas of Boulogne and Leon soils. These soils are in the higher positions on the landscape. They are generally in areas less than 3 acres in size.

Permeability is slow to moderately rapid in the Kingsferry and Allanton soils. Available water capacity is moderate. In most years the seasonal high water table is within a depth of 6 inches during wet periods.

These soils are in the Scrub Bog-Bay Swamp ecological community *(30)*. This community is dominated by gallberry, fetterbush lyonia, myrtleleaf holly, swamp cyrilla, greenbriers, sweet pepperbush, and sweetbay and has scattered slash pine and pond pine. Cinnamon fern, maidencane, and sphagnum moss commonly grow in open areas. Scrub bogs are predominantly dense masses of evergreen shrubs that seldom exceed 25 feet in height. Bay swamps are forested wetlands dominated by one or two species of evergreen trees. The bay swamps are climax communities that have mature trees. The scrub bogs are in the earlier stages of plant succession. Some areas of scrub bogs remain in the subclimax stage because of periodic fire. The shrubs have many stems and thick foliage and commonly appear impenetrable.

The potential productivity of these soils for pines is high. Adequate surface drainage or bedding is needed to regenerate the forest stand and to obtain potential productivity. Slash pine is suitable for planting on prepared sites. Site preparation, such as bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks and harvesting during dry periods help to overcome the equipment limitation and minimize soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

These soils are moderately suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderately good yields if the pasture is properly managed. A drainage system is needed to remove excess water. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

These soils are very poorly suited to cultivated crops. The seasonal high water table is a limitation affecting most crops. A drainage system is needed to remove excess water. Lime and fertilizer should be applied according to the needs of the crop.

These soils are very poorly suited to septic tank absorption fields and to dwellings without basements because of the seasonal high water table. If the soils are used as a site for septic tank absorption fields, mounding may be needed. Careful consideration is needed if these soils are used for urban development.

The capability subclass is IVw. The woodland ordination symbol is 11W.

28—Mandarin sand. This somewhat poorly drained, nearly level soil is on narrow ridges and isolated knolls in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is dark gray sand about 4 inches thick. The subsurface layer, to a depth of about 24 inches, is gray sand. The upper part of the subsoil, to a depth of 45 inches, is dark reddish brown sand, reddish brown sand, and yellowish brown sand. Below this, to a depth of 70 inches, is an intervening layer of light brownish gray and grayish brown sand. The lower part of the subsoil to a depth of 80 inches or more is black fine sand.

On 88 percent of the acreage mapped as Mandarin sand, Mandarin and similar soils make up 80 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 20 percent. On 12 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas.

Included in mapping are areas of soils that are similar to the Mandarin soil. The depth to the subsoil in these soils is more than 30 inches. In the Lake City Ridge area, the Mandarin soil is fine sand, but in the Trail Ridge area it is dominantly sand.

Dissimilar soils that are included with the Mandarin soil in mapping occur as small areas of Hurricane and Leon soils and areas of Pottsburg sand, high. Hurricane and Pottsburg soils are in the higher positions on the landscape. Leon soils are in the lower positions on the landscape. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderate in the Mandarin soil. Available water capacity is low. In most years the seasonal high water table is at a depth of 18 to 42 inches, except during dry periods. In some years, during wet periods, it is at a depth of 12 to 18 inches for as long as 2 weeks.

This soil is in the North Florida Flatwoods ecological community *(30)*. This community is generally dominated by slash pine. The understory includes grasses, live oak, saw palmetto, and scattered water oak and laurel oak. Chalky bluestem, broomsedge bluestem, low panicums, and wiregrass are the more common grasses. Other common plants include grassleaf goldaster, blackberry, gayfeather, milkwort, and a variety of seed-producing legumes.

The potential productivity of this soil for pine trees is moderate. Slash pine and longleaf pine are suitable for planting. Site preparation, such as bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks and harvesting during dry periods help to overcome the equipment limitation and minimize soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is very poorly suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderately good yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is generally unsuited to cultivated crops. The seasonal high water table, low fertility, and droughtiness are limitations affecting crops.

This soil is poorly suited to septic tank absorption fields and moderately suited to dwellings without basements. The seasonal high water table and a poor filtering capacity are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed. If the density of housing is moderate or high, a community sewage system can prevent the contamination of ground water resulting from seepage.

The capability subclass is VIs. The woodland ordination symbol is 8S.

29—Mascotte fine sand. This poorly drained, nearly level soil is in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is black fine sand about 6 inches thick. The subsurface layer, to a depth of about 18 inches, is light gray fine sand. The upper part of the subsoil is black and dark reddish brown fine sand to a depth of 24 inches and light yellowish brown fine sand to a depth of 29 inches. Below this, to a depth of 38 inches, is an intervening layer of light gray fine sand. The lower part of the subsoil is gray fine sandy loam and grayish brown loamy fine sand. The underlying material to a depth of 80 inches or more is grayish brown loamy fine sand.

On 96 percent of the acreage mapped as Mascotte fine sand, Mascotte and similar soils make up 85 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 15 percent. On 4 percent of the acreage, the dissimilar soils make up more than 15 percent of the mapped areas.

Included in mapping are areas of soils that are similar to the Mascotte soil. These are Olustee and Sapelo soils and soils, near depressions, that have a surface layer of mucky fine sand.

Dissimilar soils that are included with the Mascotte soil in mapping occur as small areas of Leefield, Ocilla, Pantego, Pelham, Plummer, and Rains soils. Ocilla and Leefield soils are in the higher positions on the landscape. Pelham, Plummer, and Rains soils are in the lower positions on the landscape. Pantego soils are in depressions. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderately slow in the Mascotte soil. Available water capacity is low. In most years the seasonal high water table is at a depth of 6 to 18 inches during wet periods.

This soil is in the North Florida Flatwoods ecological community *(30)*. This community is generally dominated by slash pine. The understory includes saw palmetto, gallberry, and grasses. Scattered water oak and laurel oak and several species of blueberry and waxmyrtle also are common. Chalky bluestem, broomsedge bluestem, lopsided indiangrass, low panicums, and wiregrass are the more common grasses. Other common plants include grassleaf goldaster, blackberry, brackenfern, deer tongue, gayfeather, milkwort, and a variety of seed-producing legumes. Fetterbush lyonia, redbay, loblolly-bay, and sweetbay are in areas near depressions.

The potential productivity of this soil for pine trees is high. Slash pine, loblolly pine, and longleaf pine are suitable for planting. Site preparation, such as bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks and harvesting during dry periods help to overcome the equipment limitation and minimize soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderately good yields if the pasture is properly managed. A drainage system is needed to remove excess water. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is moderately suited to cultivated crops. The seasonal high water table, low fertility, and droughtiness are limitations affecting most crops. A drainage system is needed to remove excess water. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table and a poor filtering capacity are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed. If the density of housing is moderate or high, a community sewage system can prevent the contamination of ground water resulting from seepage.

The capability subclass is IIIw. The woodland ordination symbol is 11W.

30—Murville fine sand. This very poorly drained, nearly level soil is on broad, low flats in the flatwoods.

Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is black fine sand about 10 inches thick. The subsoil is dark reddish brown fine sand to a depth of about 35 inches, dark brown fine sand to a depth of 42 inches, dark reddish brown fine sand to a depth of 60 inches, and black fine sand to a depth of 80 inches or more.

On 80 percent of the acreage mapped as Murville fine sand, Murville and similar soils make up 75 to 90 percent of the mapped areas. Dissimilar soils make up 10 to 25 percent. On 20 percent of the acreage, the dissimilar soils make up less than 10 percent or more than 25 percent of the mapped areas.

Soils that are similar to the Murville soil are included in mapping. These are Kingsferry soils and soils in which the surface layer is 14 to 20 inches thick.

Dissimilar soils that are included with the Murville soil in mapping occur as small areas of Boulogne and Leon soils. These soils are in the higher positions on the landscape. They are generally in areas less than 3 acres in size.

Permeability is moderate in the Murville soil. Available water capacity also is moderate. In most years the seasonal high water table is within a depth of 6 inches during wet periods.

This soil is in the Scrub Bog-Bay Swamp ecological community *(30)*. This community is dominated by gallberry, fetterbush lyonia, myrtleleaf holly, swamp cyrilla, greenbriers, sweet pepperbush, and sweetbay and has scattered slash pine and pond pine. Cinnamon fern, maidencane, and sphagnum moss commonly grow in open areas. Scrub bogs are predominantly dense masses of evergreen shrubs that seldom exceed 25 feet in height. Bay swamps are forested wetlands dominated by one or two species of evergreen trees. The bay swamps are climax communities that have mature trees. The scrub bogs are in the earlier stages of plant succession. Some areas of scrub bogs remain in the subclimax stage because of periodic fire. The shrubs have many stems and thick foliage and commonly appear impenetrable.

The potential productivity of this soil for pine trees is high. Adequate surface drainage or bedding is needed to regenerate the forest stand and to obtain potential productivity. Slash pine is suitable for planting on prepared sites. Site preparation, such as bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks and harvesting during dry periods help to overcome the equipment limitation and minimize soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is moderately suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderately good yields if the pasture is properly managed. A drainage system is needed to remove excess water. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is very poorly suited to cultivated crops. The seasonal high water table is a limitation affecting most crops. A drainage system is needed to remove excess water. Lime and fertilizer should be applied according to the needs of the crop.

This soil is very poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table and a poor filtering capacity are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed. Careful consideration is needed if this soil is used for urban development.

The capability subclass is Vw. The woodland ordination symbol is 11W.

32—Ocilla fine sand, 0 to 3 percent slopes. This somewhat poorly drained, nearly level or gently sloping soil is on narrow to broad ridges and isolated knolls in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark gray fine sand about 9 inches thick. The subsurface layer is very pale brown fine sand to a depth of about 22 inches and yellow loamy fine sand to a depth of 26 inches. The subsoil is light brownish gray fine sandy loam to a depth of 32 inches, light brownish gray sandy clay loam to a depth of 41 inches, and gray sandy clay loam to a depth of 80 inches or more.

On 92 percent of the acreage mapped as Ocilla fine sand, 0 to 3 percent slopes, Ocilla and similar soils make up 94 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 6 percent. On 8 percent of the acreage, dissimilar soils make up more than 6 percent of the mapped areas.

Soils that are similar to the Ocilla soil are included in mapping. These are Albany, Duplin, and Leefield soils and soils that have a water table at a depth higher than that in the Ocilla soil. Duplin soils are near drainageways.

Dissimilar soils that are included with the Ocilla soil in mapping occur as small areas of Albany, Leefield, Mascotte, Olustee, and Pelham soils and the moderately wet Blanton soils. Albany, Blanton, and Leefield soils are in positions on the landscape similar to those of the Ocilla soil. Mascotte, Olustee, and Pelham soils are in the lower positions on the landscape. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderate or moderately slow in the Ocilla soil. Available water capacity is low. In most years the seasonal high water table is at a depth of 12 to 30 inches, except during dry periods. In some years, during wet periods, it is at a depth of 6 to 12 inches for as long as 2 weeks.

This soil is in the Mixed Hardwood and Pine ecological community *(30)*. This community is dominated by bluejack oak, southern red oak, laurel oak, and live oak and has common slash pine, loblolly pine, and longleaf pine. Other common trees include sweetgum, black cherry, hickory, and water oak. Common understory plants are hawthorn, blackberry, sparkleberry, American beautyberry, waxmyrtle, blueberry, wild plum, and sassafras. Common herbaceous plants, vines, and grasses include wild grape, greenbriers, yellow jessamine, trumpet creeper, broomsedge bluestem, and wiregrass. Quantities and types of vegetation can vary greatly, depending on the successional stage. In the climax stage, which has a closed canopy dominated by oaks, understory vegetation may be quite sparse.

The potential productivity of this soil for pine trees is high. Slash pine, loblolly pine, and longleaf pine are suitable for planting. Site preparation, such as harrowing and bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderate yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is moderately suited to cultivated crops. Seasonal wetness, droughtiness, and low fertility are management concerns affecting most crops. Irrigation is needed in some years. Residue management, including conservation tillage, conserves moisture during dry periods and helps to control erosion. A drainage system is needed for some crops. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table is the main management concern. If the soil is used as a site for septic tank absorption fields, mounding may be needed.

The capability subclass is IIIw. The woodland ordination symbol is 11W.

33—Olustee-Pelham complex. These poorly drained, nearly level soils are in the flatwoods. Individual areas are circular or oblong and range from about 10 to more than 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer of the Olustee soil is very dark gray fine sand about 8 inches thick. The upper part of the subsoil, to a depth of about 14 inches, is dark brown fine sand. Below this, to a depth of 37 inches, is a layer of light gray fine sand. The lower part of the subsoil to a depth of 80 inches or more is light brownish gray fine sandy loam and sandy clay loam.

Typically, the surface layer of the Pelham soil is black fine sand about 7 inches thick. The subsurface layer, to a depth of about 35 inches, is dark grayish brown fine sand. The subsoil to a depth of 80 inches or more is light gray sandy clay loam.

On 99 percent of the acreage mapped as Olustee-Pelham complex, Olustee, Pelham, and similar soils make up 90 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 10 percent. On 1 percent of the acreage, dissimilar soils make up more than 10 percent of the mapped areas. Generally, the mapped areas are about 68 percent Olustee and similar soils and 31 percent Pelham and similar soils. The percentage of Pelham and similar soils is higher in the Osceola National Forest.

Small areas of soils that are similar to the Olustee soil are included in mapping. These are Mascotte and Sapelo soils and soils that have a loamy subsoil below a depth of 40 inches. Also included in mapping are Plummer soils, which are similar to the Pelham soil.

Dissimilar soils that are included with the Olustee and Pelham soils in mapping occur as small areas of Albany, Ocilla, and Rains soils. Albany and Ocilla soils are in the higher positions on the landscape, and Rains soils are in the lower positions. The dissimilar soils are generally in areas less than 3 acres in size.

The components of this map unit occur as areas so intricately intermingled that it is not practical to map them separately at the scale used in mapping. The proportions and patterns of the Olustee and Pelham soils and of the similar soils are relatively consistent in most mapped areas.

Permeability is moderate or moderately slow in the Olustee and Pelham soils. Available water capacity is low. In most years the seasonal high water table is at a depth of 6 to 18 inches during wet periods.

These soils are in the North Florida Flatwoods ecological community *(30)*. This community is generally dominated by slash pine. The understory includes saw palmetto, gallberry, and grasses. Scattered water oak and laurel oak and several species of blueberry and waxmyrtle also are common. Chalky bluestem, broomsedge bluestem, lopsided indiangrass, low panicums, and wiregrass are the more common grasses. Other common plants include grassleaf goldaster, blackberry, brackenfern, deer tongue, gayfeather, milkwort, and a variety of seed-producing legumes.

The potential productivity of these soils for pine trees is high. Slash pine and longleaf pine are suitable for planting. Site preparation, such as bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks and harvesting during dry periods help to overcome the equipment limitation and minimize soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

These soils are well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderately good yields if the pasture is properly managed. A drainage system is needed to remove excess water. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

These soils are moderately suited to cultivated crops. The seasonal high water table, low fertility, and droughtiness are limitations affecting most crops. A drainage system is needed to remove excess water. Lime and fertilizer should be applied according to the needs of the crop.

These soils are poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table is the main management concern. If the soil is used as a site for septic tank absorption fields, mounding may be needed.

The capability subclass is IIIw. The woodland ordination symbol is 11W.

34—Ortega sand, 0 to 5 percent slopes. This moderately well drained, nearly level or gently sloping soil is on narrow to broad ridges and isolated knolls. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark gray and grayish brown sand about 7 inches thick. The underlying material to a depth of 80 inches or more is light yellowish brown and very pale brown sand.

On 93 percent of the acreage mapped as Ortega sand, 0 to 5 percent slopes, Ortega and similar soils make up 90 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 10 percent. On 7 percent of the acreage, the dissimilar soils make up more than 10 percent of the mapped areas.

Included in mapping are areas of soils that are similar to the Ortega soil but have a dark, sandy subsoil. In the Lake City Ridge area, the Ortega soil is fine sand, but in the Trail Ridge area it is dominantly sand.

Dissimilar soils that are included with the Ortega soil in mapping occur as small areas of Kershaw and Ridgewood soils. Kershaw soils are in the higher positions on the landscape, and Ridgewood soils are in the lower positions. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is rapid in the Ortega soil. Available water capacity is very low. In most years the seasonal high water table is at a depth of 42 to 60 inches, except during dry periods. In some years, during wet periods, it is at a depth of 30 to 42 inches for as long as 2 weeks.

This soil is in the Longleaf Pine-Turkey Oak Hills ecological community *(30)*. This community is dominated by longleaf pine, turkey oak, bluejack oak, and sand post oak. Common shrubs include Adam's needle, coontie, coralbean, shining sumac, and yaupon. Pricklypear, partridge pea, blazing star, elephants-foot, grassleaf goldaster, yellow indiangrass, and dropseed are also common.

The potential productivity of this soil for pine trees is moderately high. Slash pine and longleaf pine are suitable for planting. Site preparation, such as harrowing, helps to establish seedlings. Chopping reduces debris, controls competing vegetation, and facilitates planting. Using planting stock that is larger than usual or that is containerized can reduce the seedling mortality rate. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is moderately suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderate yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is moderately suited to cultivated crops. Droughtiness and low fertility are limitations affecting most crops. Irrigation is needed during dry periods. Residue management, including conservation tillage, conserves moisture during dry periods and helps to control erosion. Lime and fertilizer should be applied according to the needs of the crop.

This soil is moderately suited to septic tank absorption fields and well suited to dwellings without basements. The seasonal high water table and a poor filtering capacity are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed. If the density of housing is moderate or high, a community sewage system can prevent the contamination of ground water resulting from seepage.

The capability subclass is IIIs. The woodland ordination symbol is 10S.

35—Ousley fine sand, 2 to 5 percent slopes, occasionally flooded. This somewhat poorly drained, nearly level or gently sloping soil is on low, slightly elevated terraces next to the flood plains. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark gray and gray fine sand about 10 inches thick. The underlying material to a depth of 80 inches or more is light gray, white, and dark brown fine sand.

On 98 percent of the acreage mapped as Ousley fine sand, 2 to 5 percent slopes, occasionally flooded, Ousley and similar soils make up 90 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 10 percent of the mapped areas. On 2 percent of the acreage, the dissimilar soils make up more than 10 percent of the mapped areas.

Small areas of soils that are similar to the Ousley soil are included in mapping. These are soils that are stratified with organic matter and soils, near river banks, that have pale brown and very pale brown subsurface layers.

Dissimilar soils that are included with the Ousley soil in mapping occur as small areas of Osier soils. These soils are on flood plains. They are generally in areas less than 3 acres in size.

Permeability is rapid in the Ousley soil. Available water capacity is very low. In most years the seasonal high water table is at a depth of 18 to 36 inches, except during dry periods. In some years, during wet periods, it is at a depth of 12 to 18 inches for as long as 2 weeks. The water table is lower in areas near river banks. Flooding occurs during some years.

This soil is in the Upland Hardwood Hammocks ecological community *(30)*. This community is dominated by laurel oak, live oak, and water oak and has scattered longleaf pine, loblolly pine, and slash pine. Other common trees include sweetgum, hickory, wild cherry, magnolia, and flowering dogwood. Common shrubs are sparkleberry, American beautyberry, saw palmetto, and waxmyrtle. Common herbaceous plants, vines, and grasses are greenbriers, wild grape, trumpet creeper, crossvine, yellow jessamine, low panicums, switchgrass, and broomsedge bluestem.

The potential productivity of this soil for pine trees is moderately high. Slash pine and longleaf pine are suitable for planting. Site preparation, such as harrowing and bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderate yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is moderately suited to cultivated crops. Droughtiness and low fertility are limitations affecting most crops. Irrigation is needed during dry periods. Residue management, including conservation tillage, conserves moisture during dry periods and helps to control erosion. Lime and fertilizer should be applied according to the needs of the crop. In some years flooding may damage crops.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table, the flooding, and a poor filtering capacity are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed. Careful consideration is needed if this soil is used for urban development (figs. 10 and 11).

The capability subclass is IIIw. The woodland ordination symbol is 10W.

Figure 10.—An area of Ousley fine sand, 2 to 5 percent slopes, occasionally flooded, during a dry period.

36—Pantego-Pamlico, loamy substratum, complex, depressional. These very poorly drained, nearly level soils are in depressions in the flatwoods. Individual areas are circular or oblong and range from about 10 to more than 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer of the Pantego soil is black muck, black mucky fine sandy loam, and very dark gray fine sandy loam about 36 inches thick. The subsoil to a depth of 80 inches or more is light brownish gray sandy clay loam.

Typically, the surface layer of the Pamlico soil is black muck about 18 inches thick. The underlying material is black mucky fine sand to a depth of 22 inches, grayish brown fine sand to a depth of 30 inches, dark gray loamy fine sand to a depth of 42 inches, dark gray sandy clay loam to a depth of 55 inches, and dark grayish brown loamy fine sand to a depth of 70 inches or more.

On 99 percent of the acreage mapped as Pantego-Pamlico, loamy substratum, complex, depressional, Pantego, Pamlico, and similar soils make up 80 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 20 percent. Generally, the mapped areas are about 65 percent Pantego and similar soils and 34 percent Pamlico and similar soils.

Included in mapping are soils that are similar to the Pantego soil but have a layer of muck that is more than 10 inches thick over the black and very dark gray surface layer.

Dissimilar soils that are included with the Pantego and Pamlico soils in mapping occur as small areas of Olustee, Pelham, Plummer, and Rains soils. These soils are on the edges of depressions. They are generally in areas less than 3 acres in size.

The components of this map unit occur as areas so intricately intermingled that it is not practical to map them separately at the scale used in mapping. The proportions and patterns of the Pantego and Pamlico soils and of the similar soils are relatively consistent in most mapped areas.

Permeability is moderately slow in the Pantego and Pamlico soils. Available water capacity is moderate or high. The seasonal high water table is at the surface or

Figure 11.—A flooded area of Ousley fine sand, 2 to 5 percent slopes, occasionally flooded.

1 to 2 feet above the surface. The water table is slightly below the surface during dry periods (fig. 12).

These soils are in the Swamp Hardwoods ecological community *(30)*. This community is dominated by blackgum, red maple, ogeechee lime, cypress, and bay trees. Common shrubs include fetterbush lyonia, Virginia willow, buttonbush, and waxmyrtle. Common herbaceous plants and vines include wild grape, greenbriers, and poison ivy. Other plants include maidencane, cinnamon fern, and sphagnum moss.

These soils are not suited to pasture, cultivated crops, or the production of planted pine trees because of ponding and the seasonal high water table.

These soils are not suited to septic tank absorption fields or to dwellings without basements. The main limitations are the ponding and the seasonal high water table.

The capability subclass is VIIw. The woodland ordination symbol is 2W.

37—Pelham fine sand. This poorly drained, nearly level soil is on broad, low flats in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is black and very dark gray fine sand about 6 inches thick. The subsurface layer, to a depth of about 26 inches, is light brownish gray fine sand. The subsoil to a depth of 80 inches or more is gray fine sandy loam and sandy clay loam.

On 94 percent of the acreage mapped as Pelham fine sand, Pelham and similar soils make up 80 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 20 percent. On 6 percent of the acreage, the dissimilar soils make up more than 20 percent.

Soils that are similar to the Pelham soil are included in mapping. These are Plummer and Rains soils; soils that have a black and very dark gray surface layer more than 8 inches thick; and soils that have a thin, very dark gray or dark gray transitional layer between the subsurface layer and the subsoil.

Dissimilar soils that are included with the Pelham soil in mapping occur as small areas of Albany, Mascotte, Mulat, Ocilla, Olustee, Sapelo, and Surrency soils.

Albany, Mascotte, Ocilla, Olustee, and Sapelo soils are in the higher positions on the landscape. Surrency and Mulat soils are in drainageways. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderate or moderately slow in the Pelham soil. Available water capacity is low. In most years the seasonal high water table commonly is at a depth of 6 to 12 inches. In the lower areas, the water table is within a depth of 6 inches.

This soil is in the North Florida Flatwoods ecological community *(30)*. This community is generally dominated by slash pine. The understory includes saw palmetto, gallberry, and grasses. Scattered water oak and laurel oak and several species of blueberry and waxmyrtle also are common. Chalky bluestem, broomsedge bluestem, lopsided indiangrass, low panicums, and wiregrass are the more common grasses. Other common plants include grassleaf goldaster, blackberry, brackenfern, deer tongue, gayfeather, milkwort, and a variety of seed-producing legumes.

The potential productivity of this soil for pine trees is high. Slash pine and loblolly pine are suitable for planting. Site preparation, such as bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks and harvesting during dry periods help to overcome the equipment limitation and minimize soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce

Figure 12.—The stains on the tree trunks in this area of Pantego-Pamlico, loamy substratum, complex, depressional, were caused by the seasonal high water table.

moderately good yields if the pasture is properly managed. A drainage system is needed to remove excess water. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is moderately suited to cultivated crops. The seasonal high water table is a limitation affecting most crops. A drainage system is needed to remove excess water. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table is the main limitation. If the soil is used as a site for septic tank absorption fields, mounding may be needed.

The capability subclass is IIIw. The woodland ordination symbol is 11W.

39—Plummer fine sand. This poorly drained, nearly level soil is on broad, low flats in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of about 45 inches, is grayish brown and light gray fine sand. The subsoil to a depth of 80 inches or more is light brownish gray sandy clay loam.

On 83 percent of the acreage mapped as Plummer fine sand, Plummer and similar soils make up 80 to 90 percent of the mapped areas. Dissimilar soils make up 10 to 20 percent. On 17 percent of the acreage, the dissimilar soils make up less than 10 percent or more than 20 percent of the mapped areas.

Soils that are similar to the Plummer soil are included in mapping. These are Pelham soils and soils that have a black and very dark gray surface layer more than 8 inches thick.

Dissimilar soils that are included with the Plummer soil in mapping occur as small areas of Albany, Leon, Mulat, Osier, Pantego, Sapelo, and Surrency soils. Mulat and Surrency soils are in drainageways. Albany soils are in the higher positions on the landscape. Leon and Sapelo soils are in the lower positions on the landscape. Pantego and Osier soils are in small depressions. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderate or moderately slow in the Plummer soil. Available water capacity is low. In most years the seasonal high water table is commonly at a depth of 6 to 12 inches. In the lower areas, the water table is within a depth of 6 inches during wet periods.

This soil is in the North Florida Flatwoods ecological community *(30)*. This community is generally dominated by slash pine. The understory includes saw palmetto, gallberry, and grasses. Scattered water oak and laurel oak and several species of blueberry and waxmyrtle also are common. Chalky bluestem, broomsedge bluestem, lopsided indiangrass, low panicums, and wiregrass are the more common grasses. Other common plants include grassleaf goldaster, blackberry, brackenfern, deer tongue, gayfeather, milkwort, and a variety of seed-producing legumes.

The potential productivity of this soil for pine trees is high. Slash pine and loblolly pine are suitable for planting. Site preparation, such as bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks and harvesting during dry periods help to overcome the equipment limitation and minimize soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderately good yields if the pasture is properly managed. A drainage system is needed to remove excess water. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is poorly suited to cultivated crops. The seasonal high water table is a limitation affecting most crops. A drainage system is needed to remove excess water. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table and a poor filtering capacity are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed. If the density of housing is moderate or high, a community sewage system can prevent the contamination of ground water resulting from seepage.

The capability subclass is IVw. The woodland ordination symbol is 11W.

40—Pamlico muck, loamy substratum, depressional. This very poorly drained, nearly level soil is in depressions. Individual areas are circular or oblong and range from about 10 to more than 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is black muck about 18 inches thick. The underlying material is black mucky fine sand to a depth of 22 inches, grayish brown fine sand to a depth of 30 inches, dark gray loamy fine sand to a depth of 42 inches, dark gray sandy clay loam to a depth of 55 inches, and dark grayish brown loamy fine sand to a depth of 70 inches or more.

On 89 percent of the acreage mapped as Pamlico muck, loamy substratum, depressional, Pamlico and similar soils make up 80 to 90 percent of the mapped areas. Dissimilar soils make up 10 to 14 percent.

Soils that are similar to the Pamlico soil are included in mapping. These are Dorovan soils, soils that have a subsoil with organic stains between the muck and the loamy substratum, and soils that do not have a sandy layer between the muck and the loamy substratum.

Dissimilar soils that are included with the Pamlico soil in mapping occur as small areas of Pantego, Pelham, and Plummer soils. Pantego soils are in positions on the landscape similar to those of the Pamlico soil. Pelham and Plummer soils are at the edges of the mapped areas. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is slow in the Pamlico soil. Available water capacity is high. The seasonal high water table is at the surface or 1 to 2 feet above the surface. The water table is slightly below the surface during dry periods.

Most areas of this soil are in the Swamp Hardwoods ecological community *(30)*. This community is dominated by blackgum, red maple, ogeechee lime, cypress, and bay trees. Common shrubs include fetterbush lyonia, Virginia willow, buttonbush, and waxmyrtle. Common herbaceous plants and vines include wild grape, greenbriers, and poison ivy. Other plants include maidencane, cinnamon fern, and sphagnum moss. In the Pinhook Swamp area, this soil is in the Scrub Bog ecological community. Scrub bogs are predominantly dense masses of evergreen shrubs that seldom exceed 25 feet in height. This community is dominated by gallberry, fetterbush lyonia, myrtleleaf holly, swamp cyrilla, greenbriers, sweet pepperbush, and sweetbay and has scattered cypress, slash pine, and pond pine. Cinnamon fern, maidencane, and sphagnum moss commonly grow in open areas. Some areas of scrub bogs remain in the subclimax stage because of periodic fire. The shrubs have many stems and thick foliage and commonly appear impenetrable.

This soil is not suited to pasture, cultivated crops, or the production of planted pine trees because of ponding and the seasonal high water table.

This soil is not suited to septic tank absorption fields or to dwellings without basements because of the ponding and the seasonal high water table.

The capability subclass is VIIw. The woodland ordination symbol is 2W.

42—Pottsburg sand, high. This somewhat poorly drained, nearly level soil is on narrow to broad ridges and isolated knolls in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth or convex and range from 0 to 2 percent.

Typically, the surface layer is very dark gray sand about 4 inches thick. The subsurface layer, to a depth of about 52 inches, is brown, light brownish gray, very pale brown, light gray, and white sand. The subsoil to a depth of 80 inches or more is dark brown and black sand.

On 93 percent of the acreage mapped as Pottsburg sand, high, Pottsburg and similar soils make up 80 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 20 percent. On 7 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas.

Soils that are similar to this Pottsburg soil are included in mapping. These are Pottsburg soils that are in the lower areas and soils that do not have a subsoil and have slopes of as much as 3 percent. In the Lake City Ridge area, the major Pottsburg soil is fine sand, but in the Trail Ridge area it is dominantly sand.

Dissimilar soils that are included with the Pottsburg soil in mapping occur as small areas of Allanton, Boulogne, Hurricane, and Leon soils. Boulogne, Hurricane, and Leon soils are in the higher positions on the landscape, and Allanton soils are in the lower positions. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderate in the Pottsburg soil. Available water capacity is low. In most years the seasonal high water table is at a depth of 12 to 24 inches, except during dry periods. In some years, during wet periods, it is at a depth of 6 to 18 inches for as long as 2 weeks.

This soil is in the North Florida Flatwoods ecological community *(30)*. This community is normally dominated by slash pine. The understory includes saw palmetto, gallberry, and grasses. Scattered water oak and laurel oak and several species of blueberry and waxmyrtle also are common. Chalky bluestem, broomsedge bluestem, lopsided indiangrass, low panicums, and wiregrass are the more common grasses. Other common plants include grassleaf goldaster, blackberry, brackenfern, deer tongue, gayfeather, milkwort, and a variety of seed-producing legumes.

The potential productivity of this soil for pine trees is moderately high. Slash pine and longleaf pine are suitable for planting. Site preparation, such as harrowing, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping reduces debris, controls competing vegetation, and facilitates planting. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is moderately suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderate yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is poorly suited to cultivated crops. Droughtiness, low fertility, and the seasonal high water table are management concerns affecting most crops. Irrigation is needed during dry periods. A drainage system is needed for a few crops. Residue management, including conservation tillage, conserves moisture during dry periods and helps to control erosion. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table and a poor filtering capacity are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed. If the density of housing is moderate or high, a community sewage system can prevent the contamination of ground water resulting from seepage.

The capability subclass is IVw. The woodland ordination symbol is 10W.

43—Pottsburg sand. This poorly drained, nearly level soil in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth or convex and range from 0 to 2 percent.

Typically, the surface layer is black and very dark gray sand about 8 inches thick. The subsurface layer, to a depth of about 53 inches, is dark gray, light brownish gray, and brown sand. The subsoil to a depth of 80 inches or more is black sand.

On 91 percent of the acreage mapped as Pottsburg sand, Pottsburg and similar soils make up 80 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 20 percent. On 9 percent of the acreage, the dissimilar soils make up more than 20 percent.

Soils that are similar to the Pottsburg soil are included in mapping. These are Boulogne soils and soils that have a subsoil above a depth of 50 inches. In the Lake City Ridge area, the Pottsburg soil is fine sand, but in the Trail Ridge area it is dominantly sand.

Dissimilar soils that are included with this Pottsburg soil in mapping occur as small areas of Allanton, Boulogne, Evergreen, Kingsferry, Leon, and Osier soils, Pottsburg soils that are in the higher areas, and Leon soils that are in depressions. Allanton and Kingsferry soils are in the lower positions on the landscape. Osier soils are in drainageways. Evergreen soils are in small depressions. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderate in the Pottsburg soil. Available water capacity is low. In most years the seasonal high water table commonly is at a depth of 6 to 12 inches. In the lower areas, the water table is within a depth of 6 inches during wet periods.

This soil is in the North Florida Flatwoods ecological community *(30)*. This community is generally dominated by slash pine. The understory includes saw palmetto, gallberry, and grasses. Scattered water oak and laurel oak and several species of blueberry and waxmyrtle also are common. Chalky bluestem, broomsedge bluestem, lopsided indiangrass, low panicums, and wiregrass are the more common grasses. Other common plants include grassleaf goldaster, blackberry, brackenfern, deer tongue, gayfeather, milkwort, and a variety of seed-producing legumes.

The potential productivity of this soil for pine trees is moderately high. Slash pine and longleaf pine are suitable for planting. Site preparation, such as harrowing, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping reduces debris, controls competing vegetation, and facilitates planting. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is moderately suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderate yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is poorly suited to cultivated crops. Droughtiness, low fertility, and the seasonal high water table are management concerns affecting most crops. Irrigation is needed during dry periods. A drainage system is needed for a few crops. Residue management, including conservation tillage, conserves moisture during dry periods and helps to control erosion. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table and a poor filtering capacity are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed. If the density of housing is moderate or high, a community sewage system can prevent the contamination of ground water resulting from seepage.

The capability subclass is IVw. The woodland ordination symbol is 10W.

44—Rains loamy fine sand. This poorly drained, nearly level soil is on broad, low flats in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is very dark gray loamy fine sand about 8 inches thick. The subsurface layer, to a depth of about 15 inches, is grayish brown loamy fine sand. The subsoil is light brownish gray fine sandy loam to a depth of 20 inches and sandy clay loam to a depth of 80 inches or more.

On 98 percent of the acreage mapped as Rains loamy fine sand, Rains and similar soils make up 95 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 5 percent. On 2 percent of the acreage, the dissimilar soils make up more than 5 percent of the mapped areas.

Small areas of Pelham soils are included in mapping. These soils are similar to the Rains soil.

Dissimilar soils that are included with the Rains soil in mapping occur as small areas of Mascotte, Mulat, Olustee, Pantego, and Surrency soils. Olustee and Mascotte soils are in the higher positions on the landscape. Surrency and Mulat soils are in drainageways. Pantego soils are in small depressions. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderately slow in the Rains soil. Available water capacity is moderate. The seasonal high water table is within a depth of 12 inches during wet periods.

This soil is in the North Florida Flatwoods ecological community *(30)*. This community is generally dominated by slash pine. The understory includes saw palmetto, gallberry, and grasses. Scattered water oak and laurel oak and several species of blueberry and waxmyrtle also are common. Chalky bluestem, broomsedge bluestem, lopsided indiangrass, low panicums, and wiregrass are the more common grasses. Other common plants include grassleaf goldaster, blackberry, brackenfern, deer tongue, gayfeather, milkwort, and a variety of seed-producing legumes.

The potential productivity of this soil for pine trees is very high. Loblolly pine and slash pine are suitable for planting. Site preparation, such as bedding, reduces the seedling mortality rate and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks and harvesting during dry periods help to overcome the equipment limitation and minimize soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderately good yields if the pasture is properly managed. A drainage system is needed to remove excess water. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is very poorly suited to cultivated crops. The seasonal high water table is a limitation affecting most crops. A drainage system is needed to remove excess water. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table is the main limitation. If the soil is used as a site for septic tank absorption fields, mounding may be needed.

The capability subclass is IVw. The woodland ordination symbol is 12W.

46—Osier fine sand, frequently flooded. This poorly drained, nearly level soil is on the flood plains. Individual areas are elongated and range from about 10 to more than 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 6 inches thick. The underlying material to a depth of 80 inches or more is light brownish gray and white fine sand.

On 94 percent of the acreage mapped as Osier fine sand, frequently flooded, Osier and similar soils make up 90 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 10 percent. On 6 percent of the mapped areas, the dissimilar soils make up more than 10 percent of the mapped areas.

Included in mapping are soils that are similar to the Osier soil but have a thick, dark surface layer.

Dissimilar soils that are included with the Osier soil in mapping occur as small areas of Leon and Ousley soils. Leon soils are in the higher positions on the landscape.

Figure 13.—A flooded area of Osier fine sand, frequently flooded.

Ousley soils are on slightly elevated terraces next to the flood plains. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is rapid in the Osier soil. Available water capacity is low. In most years the seasonal high water table is within a depth of 12 inches during wet periods. In most years flooding occurs during winter and summer (fig. 13).

This soil is in the Swamp Hardwoods ecological community *(30)*. This community is dominated by blackgum, red maple, ogeechee lime, cypress, and bay trees. Common shrubs include fetterbush lyonia, Virginia willow, buttonbush, and waxmyrtle. Common herbaceous plants and vines include wild grape, greenbriers, and poison ivy. Other plants include maidencane, cinnamon fern, and sphagnum moss.

This soil is not suited to the production of planted pine trees. The major management concerns are flooding and the seasonal high water table. A drainage system is not practical.

This soil is not suited to pasture or cultivated crops because of the flooding and the seasonal high water table.

This soil is not suited to septic tank absorption fields or to dwellings without basements because of the flooding, the seasonal high water table, and a poor filtering capacity.

The capability subclass is Vw. The woodland ordination symbol is 7W.

47—Sapelo fine sand. This poorly drained, nearly level soil is in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 6 inches thick. The subsurface layer, to a depth of about 18 inches, is light gray fine sand. The upper part of the subsoil, to a depth of 31 inches, is black, dark reddish brown, and yellowish brown fine sand. Below this, to a depth of 48 inches, is an intervening layer of light gray fine sand. The lower part of the subsoil, to a depth of 70 inches, is light gray fine sandy loam and sandy clay loam. The underlying material to a depth of 80 inches or more is light gray fine sandy loam.

On 92 percent of the acreage mapped as Sapelo fine sand, Sapelo and similar soils make up 80 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 20 percent. On 8 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas.

Soils that are similar to the Sapelo soil are included in mapping. These are Mascotte and Olustee soils and soils, near depressions, that have a surface layer of mucky fine sand.

Dissimilar soils that are included with the Sapelo soil in mapping occur as small areas of Albany, Boulogne, Leefield, Leon, Ocilla, Pantego, Pelham, and Plummer soils. Albany, Leefield, and Ocilla soils are in the higher positions on the landscape. Pelham and Plummer soils are in the lower positions on the landscape. Boulogne and Leon soils are in positions on the landscape similar to those of the Sapelo soil. Pantego soils are in small depressions. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderate or moderately low in the Sapelo soil. Available water capacity is low. The seasonal high water table is at a depth of 6 to 18 inches during wet periods.

This soil is in the North Florida Flatwoods ecological community *(30)*. This community is generally dominated by slash pine. The understory includes saw palmetto, gallberry, and grasses. Scattered water oak and laurel oak and several species of blueberry and waxmyrtle also are common. Chalky bluestem, broomsedge bluestem, lopsided indiangrass, low panicums, and wiregrass are the more common grasses. Other common plants include grassleaf goldaster, blackberry, brackenfern, deer tongue, gayfeather, milkwort, and a variety of seed-producing legumes. Fetterbush lyonia, redbay, loblolly-bay, and sweetbay are in areas near depressions.

The potential productivity of this soil for pine trees is high (fig. 14). Slash pine, loblolly pine, and longleaf pine are suitable for planting. Site preparation, such as bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks and harvesting during dry periods help to overcome the equipment limitation and minimize soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderately good yields if the pasture is properly managed. Surface drainage, controlled grazing, and proper applications of lime and fertilizer are needed for optimum production.

This soil is poorly suited to cultivated crops. The seasonal high water table, low fertility, and droughtiness are limitations affecting most crops. A drainage system is needed to remove excess water. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table and a poor filtering capacity are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed. If the density of housing is moderate or high, a community sewage system can prevent the contamination of ground water resulting from seepage.

The capability subclass is IVw. The woodland ordination symbol is 11W.

51—Leon fine sand, occasionally flooded. This poorly drained, nearly level soil is on flatwoods adjacent to flood plains. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark gray fine sand about 5 inches thick. The subsurface layer, to a depth of about 25 inches, is light gray and light brownish gray fine sand. The subsoil, to a depth of 40 inches, is dark brown and very dark brown fine sand. The underlying material to a depth of 80 inches or more is dark brown fine sand.

On 85 percent of the acreage mapped as Leon fine sand, occasionally flooded, Leon and similar soils make up 76 to 94 percent of the mapped areas. Dissimilar soils make up 6 to 24 percent.

Dissimilar soils that are included with the Leon soil in

Figure 14.—Slash pine in an area of Sapelo fine sand. Saw palmetto is a common understory plant.

mapping occur as small areas of Osier soils. These soils are in drainageways. They are generally in areas less than 3 acres in size.

Permeability is moderately rapid or moderate in the Leon soil. Available water capacity is low. The seasonal high water table is within a depth of 12 inches during wet periods. Flooding occurs in some years.

This soil is in the North Florida Flatwoods ecological community *(30)*. This community is generally dominated by slash pine. The understory includes saw palmetto, gallberry, and grasses. Scattered water oak and laurel oak and several species of blueberry and waxmyrtle also are common. Chalky bluestem, broomsedge bluestem, lopsided indiangrass, low panicums, and wiregrass are the more common grasses. Other common plants include grassleaf goldaster, blackberry, brackenfern, deer tongue, gayfeather, milkwort, and a variety of seed-producing legumes.

The potential productivity of this soil for pine trees is moderate. Slash pine and longleaf pine are suitable for planting. Site preparation, such as harrowing and bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderate yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is poorly suited to cultivated crops. The seasonal high water table, droughtiness, and low fertility are management concerns affecting most crops. A drainage system is needed to remove excess water. Lime and fertilizer should be applied according to the needs of the crop. In some years flooding may damage crops.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table, flooding, and a poor filtering capacity are the main management concerns. Careful consideration is needed if this soil is used for urban development.

The capability subclass is IVw. The woodland ordination symbol is 8W.

52—Mascotte-Pamlico, loamy substratum, complex, depressional. This very poorly drained, nearly level soil is in depressions in the flatwoods. Individual areas are circular or oblong and range from about 10 to more than 100 acres in size. Slopes are smooth to concave and range from 0 to 2 percent.

Typically, the surface layer of the Mascotte soil is black muck to a depth of 6 inches and mucky fine sand to a depth of about 9 inches. The subsurface layer, to a depth of about 22 inches, is light gray fine sand. The subsoil is dark brown fine sand to a depth of 38 inches and grayish brown fine sandy loam to a depth of 80 inches or more.

Typically, the surface layer of the Pamlico soil is black muck about 25 inches thick. The underlying material is black mucky fine sand to a depth of 30 inches, light brownish gray fine sand to a depth of 50 inches, and grayish brown sandy clay loam to a depth of 80 inches or more.

On 94 percent of the acreage mapped as Mascotte-Pamlico, loamy substratum, complex, depressional, Mascotte, Pamlico, and similar soils make up 75 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 25 percent. On 6 percent of the acreage, the dissimilar soils make up more than 25 percent of the mapped areas.

Soils that are similar to the Mascotte and Pamlico soils are included in mapping. These are Dorovan and Olustee soils and soils that are similar to the Mascotte soil but have a surface layer of muck 8 to 16 inches thick.

Dissimilar soils that are included with the Mascotte and Pamlico soils in mapping occur as small areas of Pelham and Plummer soils and small areas of Mascotte fine sand. Mascotte fine sand is in the higher positions on the landscape. Pelham and Plummer soils are at the edges of the mapped areas, between depressions and the flatwoods. The dissimilar soils are generally in areas less than 3 acres in size.

The components of this map unit occur as areas so intricately intermingled that it is not practical to map them separately at the scale used in mapping. The proportions and patterns of the Sapelo and Pamlico soils and of the similar soils are relatively consistent in most mapped areas.

Permeability is moderately slow in the Mascotte soil and slow in the Pamlico soil. Available water capacity is moderate in the Mascotte soil and high in the Pamlico soil. In most years the seasonal high water table is at the surface to 12 inches above the surface during wet periods in both soils.

These soils are in the Scrub Bog-Bay Swamp ecological community *(30)*. This community is dominated by gallberry, fetterbush lyonia, myrtleleaf holly, swamp cyrilla, greenbriers, sweet pepperbush, and sweetbay and has scattered cypress, slash pine, and pond pine. Cinnamon fern, maidencane, and sphagnum moss commonly grow in open areas. Scrub bogs are predominantly dense masses of evergreen shrubs that seldom exceed 25 feet in height. Bay swamps are forested wetlands dominated by one or two species of evergreen trees. The bay swamps are climax communities that have mature trees. The scrub bogs are in the earlier stages of plant succession. Some areas of scrub bogs remain in the subclimax stage because of periodic fire. The shrubs have many stems and thick foliage and commonly appear impenetrable.

This map unit is not suited to pasture, cultivated crops, or the production of planted pine trees because of ponding and the seasonal high water table.

This map unit is not suited to septic tank absorption fields or to dwellings without basements because of the ponding and the seasonal high water table.

The capability subclass is VIIw. The woodland ordination symbol is 2W.

53—Mascotte fine sand, low. This poorly drained, nearly level soil is in the flatwoods near depressions. Individual areas are irregular in shape and range from about 3 to 40 acres in size. Slopes are nearly smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is black fine sand about 9 inches thick. The subsurface layer, to a depth of about 16 inches, is light gray fine sand. The upper part of the subsoil, to a depth of 22 inches, is black and dark reddish brown fine sand. Below this, to a depth of 36 inches, is an intervening layer of light gray fine sand. The lower part of the subsoil, to a depth of 42 inches, is grayish brown fine sandy loam. The underlying material to a depth of 80 inches or more is light brownish gray sandy clay loam.

On 96 percent of the acreage mapped as Mascotte fine sand, low, Mascotte and similar soils make up 85 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 15 percent. On 4 percent of the acreage, the dissimilar soils make up more than 15 percent of the mapped areas.

Small areas of Sapelo soils are included in mapping. These soils are similar to the Mascotte soil.

Dissimilar soils that are included with the Mascotte soil in mapping occur as small areas of Pantego, Pelham, and Plummer soils. Pelham and Plummer soils are in the lower positions on the landscape. Pantego soils are in depressions. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderately slow in the Mascotte soil. Available water capacity is moderate. In most years the seasonal high water table is within a depth of 6 inches during wet periods.

This soil is in the Scrub Bog-Bay Swamp ecological community *(30)*. This community is dominated by gallberry, fetterbush lyonia, myrtleleaf holly, swamp cyrilla, greenbriers, slash pine, and pond pine. Cinnamon fern, maidencane, and sphagnum moss commonly grow in open areas. Scrub bogs are predominantly dense masses of evergreen shrubs that seldom exceed 25 feet in height. Bay swamps are forested wetlands dominated by one or two species of evergreen trees. The bay swamps are climax communities that have mature trees. The scrub bogs are in the earlier stages of plant succession. Some areas of scrub bogs remain in the subclimax stage because of periodic fire. The shrubs have many stems and thick foliage and commonly appear impenetrable.

The potential productivity of this soil for pine trees is moderately high. Slash pine and longleaf pine are suitable for planting. Site preparation, such as bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks and harvesting during dry periods help to overcome the equipment limitation and minimize soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is moderately suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderately good yields if the pasture is properly managed. A drainage system is needed to remove excess water. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is very poorly suited to cultivated crops. The seasonal high water table is a limitation affecting most crops. A drainage system is needed to remove excess water. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table and a poor filtering capacity are the main management concerns. If the soil is used as a site for septic tank absorption fields, mounding may be needed.

The capability subclass is IVw. The woodland ordination symbol is 10W.

54—Albany fine sand, 0 to 5 percent slopes. This somewhat poorly drained, nearly level or gently sloping soil is on narrow, broad ridges and isolated knolls in the flatwoods. Individual areas are irregular in shape and range from about 3 to 100 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark grayish brown fine sand about 8 inches thick. The subsurface layer, to a depth of about 59 inches, is light yellowish brown and pale yellow fine sand over brownish yellow loamy fine sand. The subsoil to a depth of 80 inches or more is gray fine sandy loam and sandy clay loam.

On 97 percent of the acreage mapped as Albany fine sand, 0 to 5 percent slopes, Albany and similar soils make up 95 to 100 percent of the mapped areas. Dissimilar soils make up 0 to 5 percent. On 3 percent of the acreage, the dissimilar soils make up more than 5 percent of the mapped areas.

Soils that are similar to the Albany soil are included in mapping. These are Hurricane, Ocilla, and Leefield soils and soils in which the surface layer is less than 6 inches thick.

Dissimilar soils that are included with the Albany soil in mapping occur as small areas of Hurricane, Leefield, Ocilla, Olustee, and Plummer soils and the moderately wet Blanton soils. Blanton soils are in the higher positions on the landscape. Plummer and Olustee soils are in the lower positions on the landscape. Hurricane, Leefield, and Ocilla soils are in positions on the landscape similar to those of the Albany soil. The dissimilar soils are generally in areas less than 3 acres in size.

Permeability is moderate or moderately slow in the Albany soil. Available water capacity is low. In most years the seasonal high water table is at a depth of 12 to 30 inches, except during dry periods. In some years, during wet periods, it is at a depth of 6 to 12 inches for as long as 2 weeks.

This soil is in the Mixed Hardwood and Pine ecological community *(30)*. This community is dominated by bluejack oak, southern red oak, laurel oak, and live oak and has common slash pine, loblolly pine, and longleaf pine. Other common trees include sweetgum, black cherry, hickory, and water oak. Common understory plants are hawthorn, blackberry, sparkleberry, American beautyberry, waxmyrtle, blueberry, wild plum, and sassafras. Common herbaceous plants, vines, and grasses include wild grape, greenbriers, yellow jessamine, trumpet creeper, broomsedge bluestem, and wiregrass. Quantities and types of vegetation can vary greatly, depending on the successional stage. In the climax stage, which has a closed canopy dominated by oaks, understory vegetation may be quite sparse.

The potential productivity of this soil for pine trees is high. Slash pine, loblolly pine, and longleaf pine are suitable for planting. Site preparation, such as harrowing and bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Chopping and bedding reduce debris, control competing vegetation, and facilitate planting. Using field machinery equipped with large tires or tracks helps to overcome the equipment limitation and minimizes soil compaction and root damage during thinning activities. Logging systems that leave plant debris well distributed over the site increase the content of organic matter and improve fertility. The trees respond well to applications of fertilizer.

This soil is well suited to tame pasture grasses. Improved bermudagrass and bahiagrass produce moderate yields if the pasture is properly managed. Controlled grazing and proper applications of lime and fertilizer are needed for optimum production.

This soil is moderately suited to cultivated crops. Droughtiness and low fertility are limitations affecting most crops. Irrigation is needed during dry periods. Residue management, including conservation tillage, conserves moisture during dry periods and helps to control erosion. Lime and fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to septic tank absorption fields and to dwellings without basements. The seasonal high water table is the main limitation. If the soil is used as a site for septic tank absorption fields, mounding may be needed.

The capability subclass is IIIe. The woodland ordination symbol is 11W.

Prime Farmland

In this section, prime farmland is defined and the soils in Baker County that are considered prime farmland are listed.

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

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

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

Prime farmland soils usually receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not frequently flooded during the growing season. The slope ranges mainly from 0 to 5 percent.

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

Some soils that have a high water table qualify as prime farmland only in areas where this limitation has been overcome by drainage measures. If applicable, the need for these measures is indicated in parentheses after the map unit name in the following list. Onsite evaluation is necessary to determine if the limitation has been overcome by corrective measures. Drainage systems are not common in Baker County.

The soils identified as prime farmland in Baker County are:

20	Duplin loamy fine sand, 2 to 5 percent slopes
22	Leefield fine sand, 0 to 5 percent slopes (where drained)
32	Ocilla fine sand, 0 to 3 percent slopes (where drained)
44	Rains loamy fine sand (where drained)

Use and Management of the Soils

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

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

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

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

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

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

Crops and Pasture

Michael Sweat, county extension director, Florida Cooperative Extension Service, and Fletcher Stephens, district conservationist, Natural Resources Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Natural Resources 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 the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

About 28,000 acres in Baker County is farmland *(33)*. Of this total, about 10,000 acres is cropland and 17,000 acres is pastureland (fig. 15). The acreage used for crops and pasture has gradually been decreasing as more and more land is used for urban development.

Erosion is a hazard on the cropland and pastureland in Baker County. Information on the design of erosion-control measures for each kind of soil is available in local offices of the Natural Resources Conservation Service.

On cultivated cropland that is tilled with disks and plows, water erosion occurs at a rate of up to 5 tons of soil loss per acre per year on about 5,400 acres, 5 to 10 tons per acre per year on 1,500 acres, and greater than 10 tons per acre per year on 100 acres. Under natural conditions, most of the soils in Baker County can tolerate 5 tons of soil loss per acre per year without a substantial loss in productivity.

Soil blowing or wind erosion can be a hazard on the better drained sandy soils and on the more poorly drained sandy soils that have been drained. It can damage crops in a few hours if the wind is strong and the soil is dry and bare of vegetation or surface mulch. Soil blowing can be minimized by maintaining a vegetative cover or surface mulch; by planting windbreaks of adapted plants, such as pine, redcedar, and myrtle; and by planting properly spaced, temporary strips of seasonal small grain at a right angle to the prevailing wind.

Wind erosion occurs on fields that are bare and

Figure 15.—Pasture in an area of Ocilla fine sand, 0 to 3 percent slopes.

exposed to the wind during the months of January, February, March, and April. Wind erosion occurs at an estimated rate of up to 2 tons of soil loss per acre per year on 5,000 acres, 2 to 5 tons per acre per year on 1,500 acres, and 5 to 10 tons per acre per year on 500 acres.

Soil drainage is a major management need on most of the acreage used for crops and pasture in the county. Some soils are wet and need artificial drainage or water control for the production of specialty crops and pasture grasses. These soils include the poorly drained Boulogne, Leon, Mascotte, Pelham, Plummer, Pottsburg, and Sapelo soils and the very poorly drained Allanton and Kingsferry soils. Albany, Blanton, Hurricane, Leefield, Ocilla, Ortega, and Ridgewood soils have good natural drainage and tend to dry out quickly after rains. Irrigation is needed for crop production during periods of low rainfall.

The design of both surface and subsurface drainage systems varies with the kind of soils. Surface drainage is needed in most areas of poorly drained and very poorly drained soils that are used for specialty crops or pasture. If surface ditches are used, the poorly drained soils in the flatwoods are well suited to improved pasture grasses. Unless some of the poorly drained soils are artificially drained, excessive wetness can cause some damage to pasture grasses during wet seasons.

Soil fertility is naturally low in most soils in the survey area. Most of the soils are naturally acid.

On all soils, additions of lime and fertilizer should be based on the results of soil tests, on the needs of the crop, and on the expected level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to apply.

Field crops grown in the county include corn, grain sorghum, soybeans, vegetables, watermelons, and some tobacco. The corn and grain sorghum are used as feed for beef cattle and swine.

Some specialty crops are also grown in the county. The latest information and suggestions for growing specialty crops can be obtained from the local offices of the Cooperative Extension Service and the Natural Resources Conservation Service.

In areas of similar climate and topography, differences in the kinds and amounts of forage that a pasture can produce are closely related to the kind of soil. Pasture management is based on the relationships among soils, pasture plants, lime and fertilizer, and grazing systems. Yields can be increased by adding lime and fertilizer and by including grass-legume mixtures in the cropping system.

The major pasture plants in the county are improved bermudagrass and bahiagrass. Excess grass is harvested as hay for winter feed or is sold. Millet, sorghum, and Sudan hybrids are grown during the summer for green manure crops and for grazing. Rye, wheat, and oats are grown during the winter as forage.

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 land capability classification also is shown in the table.

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

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

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

Crops other than those shown in 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 Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

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

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

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

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

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

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

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

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

Woodland Management and Productivity

Prepared by Jay Tucker, county forester, Baker County; Barry L. Coulliett, senior forest ranger, Florida Division of Forestry; and Keith Lawrence, district ranger, Forest Service, Osceola National Forest.

About 355,566 acres, or 90 percent of Baker County, is used as woodland *(35).* About 57 percent of this woodland is owned by forest industries, 14 percent by private individuals, 28 percent by the Federal Government, and 1 percent by the State of Florida.

Forestry has played an important role in the economic development of Baker County. Before the first settlers arrived, longleaf pine dominated the better drained areas, loblolly pine grew along the St. Mary's River and its tributaries, and slash pine grew on the wetter soils in the flatwoods. Burning practices favored grasses and native grazing. Longleaf pine was the only tree that could withstand the hot fires. Baldcypress, pondcypress, blackgum, sweetgum, red maple, and loblolly-bay, redbay, and sweetbay were the principal trees on the flood plains, around ponds, and in drainageways and swamps.

Harvesting timber, collecting gum naval stores, and cutting railroad crossties once provided many jobs to area residents. In the past and to some extent in the present, timber cutting practices by private landowners have failed to provide adequate regeneration of commercially important species. Also, fire prevention allows undesirable hardwoods to grow, further inhibiting the establishment and growth of pine trees.

The soils and climate of Baker County are well suited to southern pines. Slash pine is the dominant commercial species in the county. Loblolly pine occurs naturally on Duplin and Pelham soils along the St. Mary's River and its tributaries. Natural stands of longleaf pine are scattered throughout the area on Albany, Blanton, Bonneau, Hurricane, Kershaw, Leefield, Ortega, Penney, Ridgewood, and Troup soils. The trees respond well to applications of nitrogen, phosphorus, and potassium. Loblolly pine and slash pine grow best if an adequate amount of phosphorus is applied. Additional applications of fertilizer at midrotation should be based on soil tests or tissue analysis. Timber management consists mainly of clearcutting and intensive site preparation. The thinning of pine stands for residual sawtimber growth and salvage purposes is practiced on a small scale in the area. Prescribed burning is very important for slash removal during site preparation, for reducing the wildfire hazard in established stands, and for encouraging the growth of grasses and forbs that provide food or cover for cattle and a diversity of wildlife species.

On the poorly drained soils that are dominant in most of Baker County, management practices involve the seasonal wetness and plant competition. Equipment use is severely restricted during wet times. Plant competition from heavy brush and hardwood sprouting can severely affect seedling survival and growth. Site preparation, such as chopping and bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases early growth. Bedding is needed so that natural drainage is not blocked.

A strong demand for timber is expected to continue well into the next century. This anticipated demand, along with the pressure to increase overall farm revenues, has prompted many landowners to be concerned with managing timber for maximum production.

Before the most can be made of an investment in commercial woodland, suitable trees must be selected for planting. This selection can be made through an evaluation of soil productivity as it relates to tree growth, which is determined mainly by the physical and chemical properties of the soil. One of the most important considerations affecting the productive capacity is the ability of the soil to provide adequate moisture. Other factors include thickness of the surface layer and its organic matter content, the natural supply of plant nutrients, the texture and consistence of the soil material, aeration, internal drainage, and depth to and duration of the seasonal high water table.

A well managed stand of trees can conserve soil and water resources. It protects the soil against erosion. The tree cover allows more moisture to enter the soil and thus increases the supply of ground water.

There are plentiful markets for wood products in the county. Within a 60-mile radius, there are six pulp mills—two in Jacksonville, two in Fernandina Beach, and two nearby in Georgia. Chip-n-saw logs, pole-timber, and veneer timber are aggressively marketed and sold to neighboring mills. Timber buyers and loggers are abundant. More than 20 companies serve the area. The market for cypress sawtimber is growing. Cypress is generally sawed locally for fencing and rough lumber. The residual material is sold as mulch.

The Osceola National Forest is in the midwestern part of the survey area along the border between Columbia and Baker Counties. The primary considerations for management are timber production, wildlife habitat, and recreational opportunities. Current management practices include thinning, prescribed burning, natural pine reproduction, clearcutting and tree planting, and improving the habitat for wildlife. Diversity in management practices is a key element.

More detailed information on woodland management can be obtained from the local office of the Natural Resources Conservation Service, the Cooperative Extension Service, or the Florida Division of Forestry.

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

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, and some are more susceptible to landslides and erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. In the section "Detailed Soil Map Units," the description of each map unit in the survey area suitable for timber includes information about productivity, limitations in harvesting timber, and management concerns in producing timber. The common forest understory plants also are 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 considered in forest management.

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 cords per acre. The larger the number, the greater the potential productivity. Potential productivity is based on the site quality and site index.

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation affecting use and management. The letter *R* indicates a soil that has a significant limitation because of steepness of slope. The letter *X* indicates that a soil has restrictions because of stones or rocks on the surface. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *T* indicates a soil that has, within the root zone, excessive alkalinity or acidity, sodium salts, or other toxic substances that limit the development of desirable trees. The letter *D* indicates a soil that has a limitation because of a restricted rooting depth, such as a shallow soil that is underlain by hard bedrock, a hardpan, or other layers that restrict roots. The letter *C* indicates a soil that has a limitation because of the kind or amount of clay in the upper part of the soil. The letter *S* indicates a dry, sandy soil. The letter *F* indicates a soil that has a large amount of coarse fragments. The letter *A* indicates a soil having no significant limitations that affect forest use and management. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

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, and 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 is needed. On the steepest slopes, even tracked equipment cannot be operated and more sophisticated systems are needed. The rating is *slight* if equipment use is restricted by wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are so steep that wheeled equipment cannot be operated safely across the slope, if wetness restricts equipment use from 2 to 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. The rating is *severe* if slopes are so steep that tracked equipment cannot be operated safely across the slope, if wetness restricts equipment use for more than 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. Ratings of moderate or severe indicate a need to choose the best suited equipment and to carefully plan the timing of harvesting and other management activities.

Ratings of *seedling mortality* refer to the probability of the 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 to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, rooting depth, and the aspect of the slope. The mortality rate generally is highest 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 a surface drainage system, and providing artificial shade for seedlings. Reinforcement planting is often needed if the risk is moderate or severe.

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. Plant competition is more severe on the more productive soils, on poorly drained soils, on dry, sandy soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants hinders adequate natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants hinders 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 merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand *(6, 21, 27)*.

Site quality is the average height, in feet, at age 25 years. It applies to fully stocked, even-aged, managed pine plantations. *Productivity* is the number of cords per acre per year based on the 25-year average of corresponding site quality.

The first species listed under *common trees* for a soil is the indicator species for that soil. It is the dominant species on the soil and the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

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

Grazing Land

Sid B. Brontly, range conservationist, Natural Resources Conservation Service, prepared this section.

Grazing land in Baker County is tame pasture, which is primarily bahiagrass or bermudagrass, and grazable woodland, which supports native grasses, forbs, and legumes for use as forage by livestock and wildlife. An estimated 6,000 acres of tame pasture and 150,000 acres of grazable woodland provide food and habitat for 5,500 head of cattle and for many species of wildlife.

Many of the smaller, private tracts and much of the Forest Service land are fenced and provide grazing for livestock. Many of the larger wooded tracts owned by timber companies are not fenced, and the forage produced is not utilized.

Because forage production and availability are directly related to the tree canopy, the different age classes of trees result in a wide variation in forage production within a given tract. In some places, large areas must be fenced to provide adequate forage for a small number of cattle.

Grazable woodland 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. Grazing is compatible with timber management if it is controlled or managed in such a manner that both timber and forage resources are maintained or enhanced. Prescribed burning is an important part of the woodland grazing system.

Understory vegetation is grazed by livestock and by wildlife. Some woodland, if well managed, can produce enough understory vegetation to support grazing by optimum numbers of livestock and wildlife.

Forage production on grazable woodland varies according to the different kinds of grazable woodland, the amount of shade cast by the canopy, the accumulation of fallen needles and leaves, the time and intensity of grazing, and the number, size, spacing, and method of site preparation for tree plantings.

Pastures in Baker County provide forage and habitat for a variety of wildlife species and provide filtration and storage for some of the county's freshwater supply. Pastures are managed by livestock producers and provide forage for a majority of the cattle in the county. Bahiagrass and bermudagrass are the main hay crops grown in the county. Sound management practices generally include using planned grazing systems, maintaining the proper stubble height, controlling weeds, and applying proper amounts of fertilizer and lime.

Stubble on bahiagrass is successfully managed at a height of about 2 inches. A successful grazing system includes short grazing periods followed by a rest period of 3 to 4 weeks. Stubble on bermudagrass is best managed at a height of about 4 inches. Grazing periods should be followed by a rest period of 4 to 6 weeks.

Ecological Communities

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

The concept of ecological communities is based on the awareness that a specific soil type commonly supports a specific vegetative community, which in turn provides the habitat needed by a specific wildlife species.

These vegetative communities are generally recognizable on the landscape by a casual observer after only a minimal amount of training. Even with no botanical training, an observer can soon distinguish between pine flatwoods and pine-turkey oak sandhills, between hardwood hammocks and cypress swamps, and between mangrove swamps and salt marshes. After the ecological community is identified, generalizations can be made concerning the characteristics of the soil and the types of plants and animals. Some plants grow only within a very narrow range of conditions, but many plants can survive under a wide range of conditions. Individual plants that have a wide tolerance level may occur in many different communities and on a variety of soil types. When describing ecological communities, botanists study the patterns of vegetative occurrence—what species are there, their relative abundance, the stage of plant succession, which species are dominant, their position on the landscape, and the types of soil on which this pattern occurs. Recognizable patterns of vegetation are generally found on a small group of soil types with common characteristics. Through many years of field observation, the Natural Resources Conservation Service has determined which vegetative communities commonly occur on specific soils throughout Florida *(30)*.

In the section "Detailed Soil Map Units," the vegetative communities occurring in each map unit during the climax state of plant succession are described. The descriptions of the ecological communities are based on the vegetation that would commonly occur under relatively natural conditions; however, human activities, such as pine plantings, agriculture, urbanization, and fire suppression, may have altered a community on a specific site.

Windbreaks and Environmental Plantings

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

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

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

Information on planning windbreaks and screens and on planting and caring for trees and shrubs can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Recreation

In table 7, 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 sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 7, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

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

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have 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 F. Vance, Jr., biologist, Natural Resources Conservation Service, helped prepare this section.

Baker County is primarily rural and provides good wildlife habitat. The large swamps along the St. Mary's River and its larger tributaries and the large tracts of pine flatwoods are the primary habitat types. In 1990, the Florida Game and Freshwater Fish Commission had over 40,000 acres of timberland open to the public in the Lake Butler Management Area, 100,672 acres in the Osceola Wildlife Management Area (the Osceola National Forest), and 3,600 acres in the Okefenokee National Wildlife Refuge. Also, large acreages are leased to individual hunting clubs. Current forestry practices, such as clearcutting and burning, heavily favor wildlife food and cover.

Primary game species include white-tailed deer, squirrels, turkey, bobwhite quail, feral hogs, and waterfowl. Nongame species include raccoon, rabbit, armadillo, opossum, skunks, bobcat, gray fox, red fox, otter, and a variety of songbirds, wading birds, woodpeckers, predatory birds, reptiles, and amphibians.

The freshwater streams provide good fishing. Game and nongame fish species include largemouth bass, channel catfish, bullhead catfish, bluegill, redear sunfish, spotted sunfish, warmouth, black crappie, chain pickerel, gar, bowfin, and suckers.

Some endangered and threatened species inhabit the survey area. Examples are the rare red-cockaded woodpecker and the more common alligator. A detailed list of these species and information on their range and habitat needs are available at the local office of the Natural Resources Conservation Service.

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

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

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

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, browntop millet, 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, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, cowpea, bahiagrass, clover, and alfalfa.

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

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, maple, wild grape, cherry, sweetgum, cabbage-palm, willow, bay, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are wild plum, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, cypress, 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, pickerelweed, 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, ponds, and swamps.

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

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

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

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet.

Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

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

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

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

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

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

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

Building Site Development

Table 9 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

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

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock 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 or 6 feet are not considered.

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

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock 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 10 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 10 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and 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 60 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 10 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, 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 should be considered.

The ratings in table 10 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

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

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

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, 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 11 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

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

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

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

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 11, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

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

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

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

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

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

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

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

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and releases a variety of plant nutrients as it decomposes.

Water Management

Table 12 gives information on the soil properties and site features that affect water management. The degree and kind of limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives 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 the potential for 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 control 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 erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock 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 19.

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

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

Engineering Index Properties

Table 13 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

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

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the "Glossary."

Classification of the soils is determined according to the Unified soil classification system *(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 19.

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 10, 40, and 200 (USA Standard

Series), have openings of 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

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

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

Physical and Chemical Properties

Table 14 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

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

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 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 and septic tank absorption fields.

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

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

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

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

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

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

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

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. Soils are grouped according to the following distinctions:

1. Coarse sands, 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 coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Coarse sandy loams, 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 loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, noncalcareous 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. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 14, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

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

Soil and Water Features

Table 15 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

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

The four hydrologic soil groups are:

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

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

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

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

In table 15, 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 inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 15 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. The time of year that floods are most likely to occur is expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

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

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 15 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 15.

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

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally 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 15 shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

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

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

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

Physical, Chemical, and Mineralogical Analyses of Selected Soils

Dr. Mary E. Collins, professor, Soil Science Department, University of Florida, helped prepare this section.

Parameters for physical, chemical, and mineralogical properties of representative pedons sampled in Baker County are given in tables 16, 17, and 18. The analyses were conducted and coordinated by the Soil Genesis and Characterization Laboratory at the University of Florida, Gainesville, Florida. Detailed descriptions of the analyzed soils are given in the section "Soil Series and Their Morphology." Laboratory data and profile information for additional soils in Baker County, as well as for soils in other counties in Florida, are on file at the

University of Florida, Soil Science Department.

Typical pedons were sampled from pits at carefully selected locations. Samples were air-dried, crushed, and sieved through a 2-millimeter screen. Most of the analytical methods used are outlined in a soil survey investigations report *(28)*.

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 1/10 bar and 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 modified Walkley-Black wet combustion method.

Extractable bases were obtained by leaching soils with 1.0 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 0.5 Normal barium chloride-0.2 Normal triethanolamine method at pH 8.2. Cation-exchange capacity was calculated by summation of 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 a 1.0 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. Iron, aluminum, and carbon were extracted from probable spodic horizons with 0.1 molar sodium pyrophosphate. Determination of iron and aluminum was by atomic absorption, and determination of extracted pyrophosphate carbon was by the Walkley-Black wet combustion method.

Mineralogy of the clay fraction less than 0.002 millimeter was ascertained by x-ray diffraction. Peak heights were measured at various angstrom positions representing the various clay minerals, such as kaolinite, montmorillonite, and quartz. Peaks were measured, added, and normalized to give the percentage 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.

Physical Properties

The results of physical analyses are shown in table 16. Most of the soils in Baker County are inherently sandy. Except for the Duplin and Pantego soils, all of the soils sampled have one or more horizons in which the total content of sand is more than 90 percent. The Boulogne, Hurricane, Kingsferry, Leon, Ortega, Pottsburg, and Ridgewood soils have more than 90 percent sand in each horizon to a depth of 80 inches or more. The Blanton, Mascotte, Sapelo, and Troup soils have less than 90 percent sand from a depth of 40 to more than 80 inches. Most of the finer textured material is in the deeper horizons of the Albany, Blanton, Duplin, Leefield, Mascotte, Ocilla, Olustee, Pantego, Sapelo, and Troup soils. The Duplin and Pantego soils are the only soils that have more than 30 percent clay in one or more horizons.

The content of silt is less than 10 percent in all of the soils sampled, except for the Duplin and Pantego soils. It is as high as 27 percent in some horizons of the Pantego soil.

Fine sand dominates the sand fractions in most of the soils sampled. The Hurricane, Leon, and Ortega soils, however, are dominated by sand coarser than fine sand. With the exception of the Hurricane, Leon, Ortega, Pantego, and Pottsburg soils, the soils sampled have at least one horizon with more than 50 percent fine sand. The Hurricane, Leon, Mascotte, and Ortega soils have more than 50 percent sand in at least one horizon. The content of coarse sand is less than 10 percent in all of the soils, except for the Leon soil, which is more than 10 percent coarse sand in the lower two horizons. Very coarse sand is rare and did not exceed 0.5 percent in any of the soils sampled. A common characteristic of these sandy soils is droughtiness, particularly in those soils that are well drained to excessively drained.

Hydraulic conductivity values are more than 40 centimeters per hour in at least one horizon in the Boulogne, Hurricane, Ortega, Pantego, Pottsburg, Ridgewood, and Sapelo soils. The hydraulic conductivity values in the argillic horizons, however, rarely are more than 1 centimeter per hour. Low hydraulic conductivity values at a shallow depth can affect the design and function of septic tank absorption fields. Low hydraulic conductivity values are recorded for spodic horizons in the Boulogne and Pottsburg soils, but these values are higher in the Bh horizon of other soils. The available water for plants can be estimated from bulk density and water data. In excessively sandy soils, such as the Boulogne, Hurricane, Ortega, and Ridgewood soils, the amount of water available to plants is very low. In soils that have a high content of fine textured material, such as the Duplin and Pantego soils, the amount of water available to plants is much higher.

Chemical Properties

The results of chemical analyses are shown in table 17. Most of the soils in Baker County have a relatively low content of extractable bases. The surface horizon and subsurface horizon of the Duplin soil are the only horizons sampled in which the sum of extractable calcium, magnesium, sodium, and potassium is more than 5 milliequivalents per 100 grams. The Boulogne, Hurricane, Kingsferry, Leon, Ortega, Pottsburg, Ridgewood, and Sapelo soils have less than 1 milliequivalent per 100 grams extractable bases in every horizon. The Mascotte, Olustee, and Pantego soils have one horizon with more than 1 milliequivalent per 100 grams extractable bases. The Blanton and Troup soils have two horizons that have more than 1 milliequivalent per 100 grams extractable bases, and the Albany, Duplin, Leefield, and Ocilla soils have more than two such horizons. The relatively mild, humid climate of Baker County results in the depletion of basic cations (calcium, magnesium, sodium, and potassium) through leaching.

Calcium is the dominant base in most of the soils that were sampled. Magnesium is the second most common base, but it occurs in much smaller amounts. Sodium is nondetectable in the Boulogne, Hurricane, Ortega, and Pottsburg soils. Also, the Kingsferry, Leon, Mascotte, Pantego, Ridgewood, and Sapelo soils all have one or more horizons in which sodium is nondetectable. The content of extractable potassium is less than 0.5 milliequivalent per 100 grams in all of the soils sampled, except for the Duplin soil. In the Duplin soil, it is less than 1 milliequivalent per 100 grams.

Values for cation-exchange capacity, an indicator of plant-nutrient capacity, are more than 5 milliequivalents per 100 grams in the surface horizons of all of the soils sampled, except for the Albany, Blanton, Hurricane, Leon, Ortega, Ridgewood, Sapelo, and Troup soils. Cation-exchange capacity is almost entirely a result of the amount of organic matter and the amount and kind of clay in the soil. Soils that have a very low cation-exchange capacity, such as Hurricane sand, require only a small amount of lime to alter the base status of the soil and the soil reaction in the surface horizon. Generally, soils that have low fertility have low values for extractable bases and a low cation-exchange capacity. Fertile soils generally have a high extractable base value, a high cation-exchange capacity, and a high percentage of base saturation.

The content of organic carbon is more than 1 percent in the surface horizons of the Duplin, Kingsferry, Mascotte, Olustee, Pantego, Pottsburg, and Ridgewood soils. Generally, the content of organic carbon in the soils sampled is less than 2 percent, except in the Duplin, Kingsferry, Leon, Pantego, and Sapelo soils. Significant increases in the content of organic carbon are in the Bh horizon of the Kingsferry and Leon soils. The Pantego soil has the highest content of organic carbon. Because the content of organic carbon in the surface horizon is directly related to the nutrient- and water-holding capacities of the soil, management practices that conserve organic carbon are important.

Electrical conductivity values of the soils sampled are more than 0.1 millimho per centimeter in only the surface horizon of the Duplin soil, the Btg1 horizon of the Ocilla soil, and the A1 horizon of the Pantego soil. All of the other soils tested have very low electrical conductivity. These data indicate that the content of soluble salt in the soils sampled is insufficient to hinder the growth of salt-sensitive plants.

Soil reaction in water generally ranges from pH 4.5 to pH 6.0 in the soils that were sampled. Higher values are recorded in one or more horizons of the Boulogne, Leefield, and Ortega soils. Lower values are recorded in the surface horizon of the Kingsferry, Leon, Mascotte, and Pottsburg soils and in one or more subsurface horizons of the Leon, Ocilla, and Pantego soils. The Leon soil has a pH of 4.5 or less throughout. Reaction is generally 0.5 to 1.5 pH units lower in calcium chloride and potassium chloride solutions than it is in water. The maximum availability of plant nutrients is generally attained when reaction is between pH 6.5 and 7.0. In Florida, however, maintaining the reaction of strongly acid soils above pH 6.0 is not economically feasible for most kinds of agricultural production.

The content of sodium pyrophosphate extractable iron, if it occurs, ranges from 0.01 percent in the Hurricane, Kingsferry, Pottsburg, and Sapelo soils to 0.04 percent in the Leon soil. The content of sodium pyrophosphate extractable aluminum, if it occurs, ranges from 0.01 to 0.43 percent in the Leon soil. The content of sodium pyrophosphate extractable carbon, if it occurs, ranges from 0.01 to 1.52 percent in the Leon soil. The ratio of sodium pyrophosphate extractable carbon and aluminum to clay in the Bh horizon of the Boulogne, Kingsferry, Leon, Mascotte, Olustee, Pottsburg, and Sapelo soils is sufficient to meet the chemical criteria established for spodic horizons. The content of pyrophosphate extractable iron and aluminum is sufficient to meet the criteria established for spodic horizons.

The content of citrate-dithionite extractable iron ranges from 0.01 percent in several horizons of the Leon soil to 5.80 percent in the Duplin soil. The content of citrate-dithionite extractable aluminum ranges from 0.00 percent in one horizon of the Leon soil to 0.55 percent in the C horizon of the Mascotte soil. The content of citrate-dithionite extractable iron in the soils sampled generally is higher in the Bt horizon than it is in the Bh horizon. The content of iron and aluminum in the soils of Baker County is not sufficient to restrict the availability of phosphorus.

Mineralogical Properties

Table 18 shows the clay mineralogy of several soils in Baker County. The mineralogy of the sand fractions, which are 0.05 to 2.0 millimeters in size, is siliceous. Quartz is overwhelmingly dominant in the soils sampled. Small amounts of heavy minerals are in some pedons, mainly in the very fine sand fraction. The soils have no weatherable minerals. The crystalline mineral components of the clay fraction, which is less than 0.002 millimeter in size, are reported in table 18 for selected horizons of the pedons sampled. The clay mineralogical suite is made up of montmorillonite, a 14-angstrom intergrade, kaolinite, and quartz.

Montmorillonite occurs in Mascotte, Ortega, Pantego, and Ridgewood soils. Relatively large amounts of montmorillonite are in the lower horizons of the Mascotte soil (at a depth of more than 40 inches). The 14-angstrom intergrade mineral occurs in all of the pedons sampled, except for the Mascotte soil. Kaolinite and clay-sized quartz occur in all of the pedons sampled.

Montmorillonite generally occurs in increased amounts in the lower horizons of the soils in Baker County. Therefore, montmorillonite was probably inherited from the parent material; montmorillonite is the least stable of the mineral components in this weathering environment. The 14-angstrom intergrade mineral, which is of uncertain origin, is widespread in the soils of Florida. It tends to be more common under moderately acid, relatively well drained conditions, but it occurs in a variety of soil environments. Generally, the amount of this mineral decreases with increasing depth, indicating that it is the most stable of the clay-sized minerals in this weathering environment. The content of kaolinite increases with increasing depth, and thus this mineral is less stable than the 14-angstrom intergrade. The kaolinite was most likely inherited from the parent material, but it could have formed as a weathering product of other minerals. It is relatively stable in the acidic environment of the soils in the area. Clay-sized quartz is a result of weathering of the silt-sized quartz in the soil.

Engineering Index Test Data

Table 19 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." The soil samples were tested by the Soil Laboratory, Florida Department of Transportation, 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).

Table 19 contains engineering test data for some of the major soils in Baker County. These tests help to evaluate the soils for engineering purposes. The classifications given are based on data obtained by mechanical analysis and by tests to determine liquid limits and plastic limits.

The mechanical analyses were made by the combined sieve and hydrometer method. When this method is applied, the various grain-size fractions are calculated on the basis of all the material in the soil sample, including that coarser than 2 millimeters in diameter. The results of this method 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 and then 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 19 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 *(26)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is 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 Psamment (*Psamm*, meaning sandy horizons, 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 Quartzipsamments (*Quartz*, meaning dominated by quartz, plus *psamment*, the suborder of the Entisols that are sandy).

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 Quartzipsamments.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size 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 thermic, uncoated Typic Quartzipsamments.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the underlying material can differ 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" *(31)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(26)*. 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 and gently sloping, somewhat poorly drained soils that formed in sandy and loamy marine deposits. These soils are on narrow to broad ridges and isolated knolls in the flatwoods. They are loamy, siliceous, thermic Grossarenic Paleudults.

Albany soils are associated with the moderately wet Blanton soils and Bonneau, Duplin, Hurricane, Leefield, Ocilla, Olustee, Pelham, Penney, Plummer, and Sapelo soils. The moderately wet Blanton soils and Bonneau, Duplin, and Penney soils are in the higher positions on the landscape. Bonneau and Penney soils are on side slopes, and Duplin soils are near drainageways. Olustee, Pelham, Plummer, and Sapelo soils are in the lower positions on the landscape. Hurricane, Leefield, and Ocilla soils are in positions on the landscape similar to those of the Albany soils. Hurricane soils have a spodic horizon. Leefield and Ocilla soils have an argillic horizon within a depth of 40 inches.

Typical pedon of Albany fine sand, 0 to 5 percent slopes, in a wooded area approximately 4.0 miles north of Macclenny, 0.2 mile east of Florida Highway 121, 1,525 feet west and 1,400 feet south of the northeast corner of sec. 8, T. 2 S., R. 22 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) fine sand; few fine distinct black (10YR 2/1) charcoal specks; weak fine granular structure; very friable; common fine roots; moderately acid; abrupt smooth boundary.

E1—8 to 18 inches; light yellowish brown (2.5Y 6/4) fine sand; common medium distinct dark grayish brown (10YR 4/2) and few fine distinct yellowish brown (10YR 5/6) mottles; few fine prominent black (10YR 2/1) charcoal specks; single grained; loose; few fine roots; moderately acid; gradual wavy boundary.

E2—18 to 34 inches; pale yellow (2.5Y 7/4) fine sand; common medium prominent strong brown (7.5YR 5/8) and few medium distinct dark grayish brown (10YR 4/2) mottles; few fine prominent black (10YR 2/1) charcoal specks; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

EB1—34 to 40 inches; brownish yellow (10YR 6/6) loamy fine sand; common medium distinct strong brown (7.5YR 5/8) and few medium prominent light gray (10YR 7/2) mottles; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

EB2—40 to 59 inches; brownish yellow (10YR 6/8) loamy fine sand; common medium distinct strong brown (7.5YR 5/8), few medium prominent strong brown (7.5YR 4/6), and few medium distinct light gray (10YR 7/2) mottles; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

Btg1—59 to 65 inches; gray (10YR 6/1) fine sandy loam; few medium distinct light yellowish brown (2.5Y 6/4) and few medium prominent strong brown (7.5YR 4/6) mottles; weak medium subangular blocky structure; very friable; sand grains bridged and coated with clay; very strongly acid; clear wavy boundary.

Btg2—65 to 80 inches; gray (10YR 5/1) sandy clay loam; common medium prominent light yellowish brown (2.5Y 6/4), strong brown (7.5YR 5/8), and red (2.5YR 4/8) mottles; weak medium subangular blocky structure; sand grains bridged and coated with clay; strongly acid.

The solum is more than 80 inches thick. Reaction ranges from very strongly acid to moderately acid throughout the profile. Depth to the argillic horizon ranges from 40 to 78 inches.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 1 or 2. It ranges from 4 to 10 inches in thickness.

The upper part of the E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 or 4. It has mottles in shades of white, gray, yellow, olive, brown, and red. Few or common mottles in shades of gray, brown, yellow, or red, which are generally indicative of wetness, are at a depth of 12 to 30 inches. The upper part of the E horizon ranges from fine sand to loamy fine sand. It ranges from 6 to 47 inches in thickness.

In many pedons, the lower part of the E horizon has hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 1 or 2. It has mottles in shades of yellow, olive, brown, or red. It ranges from 20 to 55 inches in thickness. The total thickness of the E horizon ranges from 34 to 73 inches.

The Bt horizon has hue of 7.5YR to 2.5Y or is neutral in hue. It has value of 5 to 7 and chroma of 0 to 6. It has mottles in shades of brown, yellow, gray, and red. In some pedons it does not have a matrix color and is mottled in shades of red, yellow, brown, and gray. The content of plinthite, if it occurs, is less than 5 percent. The Bt horizon is fine sandy loam or sandy clay loam.

Allanton Series

The Allanton series consists of nearly level, very poorly drained soils that formed in sandy marine deposits. These soils are on broad, low flats in the flatwoods. They are sandy, siliceous, thermic Grossarenic Haplaquods.

Allanton soils are associated with Boulogne, Evergreen, Kingsferry, Leon, Mandarin, Murville, Pottsburg, and Sapelo soils. Evergreen soils and some of the Leon soils are in small depressions. Boulogne, Mandarin, Pottsburg, and Sapelo soils and some Leon soils are in the higher positions on the landscape. Kingsferry and Murville soils are in positions on the landscape similar to those of the Allanton soils. Kingsferry soils have a spodic horizon at a depth of 30 to 50 inches.

Typical pedon of Allanton fine sand, in an area of Kingsferry and Allanton soils; in a wooded area approximately 5.5 miles northeast of Macclenny; 2.3 miles north of U.S. Highway 90; 2,100 feet east and 2,050 feet south of the northwest corner of sec. 12, T. 2 S., R. 22 E.

A1—0 to 9 inches; black (10YR 2/1) fine sand; moderate medium granular structure; friable; many fine, common medium, and few coarse roots; very strongly acid; gradual wavy boundary.

A2—9 to 22 inches; very dark gray (10YR 3/1) fine sand; common medium faint black (10YR 2/1) streaks; weak medium granular structure; very friable; common fine and few medium roots; very strongly acid; gradual wavy boundary.

Eg1—22 to 35 inches; dark gray (10YR 4/1) fine sand; common medium faint black (10YR 2/1) streaks; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

Eg2—35 to 42 inches; dark gray (10YR 4/1) fine sand; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

Eg3—42 to 60 inches; gray (10YR 5/1) fine sand; single grained; loose; very strongly acid; gradual wavy boundary.

Bh—60 to 80 inches; dark reddish brown (5YR 2/2) fine sand; common medium faint black (5YR 2/1), weakly cemented fragments of ortstein; massive; friable; sand grains well coated with organic matter; very strongly acid.

The solum is more than 80 inches thick. Reaction is extremely acid or very strongly acid throughout the profile. Depth to the spodic horizon ranges from 50 to 80 inches. Some pedons have an O horizon or an O horizon that blends into a mass of roots in the upper few inches of the A horizon.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1, or it is neutral in hue and has chroma of 0 or 1. It ranges from 16 to 22 inches in thickness.

The Eg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. It ranges from 25 to 40 inches in thickness.

The Bh horizon has hue of 5YR or 7.5YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is sand, fine sand, or loamy fine sand.

Blanton Series

The Blanton series consists of nearly level and gently sloping, moderately well drained soils that formed in thick deposits of sandy and loamy marine material. These soils are on narrow to broad ridges and isolated knolls. They are loamy, siliceous, thermic Grossarenic Paleudults.

Blanton soils are associated with Albany, Bonneau, Duplin, Leefield, Ocilla, Pelham, Penney, Plummer, and Troup soils. Bonneau, Penney, and Troup soils are on side slopes bordering drainageways. Albany, Leefield, Ocilla, Pelham, and Plummer soils are in the lower positions on the landscape. The clayey Duplin soils are in positions on the landscape similar to those of the Blanton soils. They are near drainageways.

Typical pedon of Blanton fine sand, moderately wet, 0 to 5 percent slopes (fig. 16), in a wooded area approximately 4 miles north of Macclenny and 2 miles east of Florida Highway 121, 1,550 feet west and 1,350 feet south of the northeast corner of sec. 8, T. 2 S., R. 22 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) fine sand; few fine distinct black (10YR 2/1) charcoal specks; weak fine granular structure; very friable; many fine roots; moderately acid; abrupt smooth boundary.

E1—8 to 21 inches; light yellowish brown (2.5Y 6/4) fine sand; few medium distinct dark grayish brown (10YR 4/2) and few fine faint pale yellow mottles; few fine distinct black (10YR 2/1) charcoal specks; single grained; loose; few fine roots; moderately acid; gradual wavy boundary.

E2—21 to 40 inches; yellow (2.5Y 7/6) fine sand; common medium distinct light gray (10YR 7/2) and few fine faint pale yellow mottles; few fine prominent black (10YR 2/1) charcoal specks; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

E3—40 to 55 inches; brownish yellow (10YR 6/6) fine sand; common medium distinct strong brown (7.5YR 5/8) and light gray (10YR 7/2) and few fine distinct brown (7.5YR 4/4) mottles; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

E4—55 to 73 inches; reticulately mottled white (10YR 8/1), light yellowish brown (10YR 6/4), yellowish brown (10YR 5/4), and strong brown (7.5YR 5/8) fine sand; single grained; loose; strongly acid; clear smooth boundary.

Btg—73 to 80 inches; light gray (10YR 6/1) sandy clay loam; common medium prominent yellowish brown (10YR 5/4) and medium red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; friable; sand grains bridged and coated with clay; very strongly acid.

The solum ranges from 60 to more than 80 inches in thickness. Reaction ranges from very strongly acid to moderately acid throughout the profile. Depth to the argillic horizon ranges from 40 to 80 inches.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 6 to 8 inches in thickness.

The E horizon has hue of 2.5Y to 7.5YR, value of 5 to 8, and chroma of 2 to 8. Few or common mottles in shades of gray, brown, yellow, or red, which are mostly indicative of wetness, are at a depth of 30 to more than 48 inches. The E horizon is fine sand or loamy fine sand. It ranges from 42 to 65 inches in thickness.

The Bt horizon, if it occurs, has hue of 2.5Y to 7.5YR, value of 5 to 7, and chroma of 3 to 8, or it is mottled in varying shades of brown, yellow, red, and gray. In most pedons it has mottles with chroma of 2 or less within the upper 10 inches. It is loamy fine sand, fine sandy loam, or sandy clay loam.

The Btg horizon has hue of 5Y to 7.5YR, value of 5 to 8, and chroma of 1 or 2, or it is neutral in hue, dominantly has chroma of 2 or less, and is mottled in varying shades of brown, yellow, red, and gray. The texture is dominantly fine sandy loam or sandy clay loam, but the range includes sandy clay at a depth of about 60 inches or more. The content of nodular plinthite is less than 5 percent within a depth of 60 inches but ranges to 15 percent below that depth.

Bonneau Series

The Bonneau series consists of sloping and strongly sloping, moderately well drained soils that formed in thick, sandy and loamy marine deposits. These soils are on upland side slopes. They are loamy, siliceous, thermic Arenic Paleudults.

Bonneau soils are associated with Albany, Blanton, Duplin, Ocilla, Osier, Penney, Ridgewood, and Troup soils. Albany, Blanton, Duplin, Ocilla, Osier, and Ridgewood soils are in the lower positions on the landscape. Duplin soils are near drainageways. Penney and Troup soils are in positions on the landscape similar to those of the Bonneau soils. Penney soils do not have an argillic horizon. Troup soils have an argillic horizon at a depth of 40 to 80 inches.

Typical pedon of Bonneau fine sand, in an area of Troup-Bonneau-Penney complex, 5 to 8 percent slopes; in a wooded area approximately 4.0 miles northwest of Macclenny and 0.6 mile west of Florida Highway 121; 4,700 feet east and 1,400 feet south of the northwest corner of sec. 8, T. 2 S., R. 22 E.

A—0 to 5 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

E1—5 to 9 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; common fine roots; very strongly acid; clear wavy boundary.

E2—9 to 17 inches; light yellowish brown (10YR 6/4) fine sand; common medium distinct light gray (10YR 7/2) mottles; single grained; loose; few fine roots; very strongly acid; clear wavy boundary.

E3—17 to 26 inches; light yellowish brown (10YR 6/4) fine sand; common medium light gray (10YR 7/2) mottles; single grained; loose; few fine roots; very strongly acid; clear wavy boundary.

Bt1—26 to 31 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine subangular blocky structure; friable; few fine roots; sand grains bridged and coated with clay; very strongly acid; clear wavy boundary.

Bt2—31 to 38 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium prominent yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; friable; few fine roots; sand grains bridged and coated with clay; very strongly acid; gradual wavy boundary.

Bt3—38 to 44 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium prominent yellowish red (5YR 5/8) and few medium distinct light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; friable; few fine roots; sand grains bridged and coated with clay; very strongly acid; gradual wavy boundary.

Bt4—44 to 70 inches; reticulately mottled light gray (10YR 7/2), red (10R 4/6 and 2.5YR 4/6), yellowish red (5YR 5/8), strong brown (7.5YR 5/6), and yellowish brown (10YR 5/6) sandy clay loam; weak very coarse subangular blocky structure; firm; sand grains bridged and coated with clay; very strongly acid; abrupt smooth boundary.

BC—70 to 80 inches; reticulately mottled strong brown (7.5YR 5/6), light gray (10YR 7/2), red (10R 4/6), and yellowish brown (10YR 5/6) fine sandy loam; massive; friable; very strongly acid.

The solum ranges from 60 to 80 inches in thickness. Reaction ranges from very strongly acid to moderately acid in the surface layer and subsurface layer, except in areas that have been limed.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 3. It ranges from 2 to 9 inches in thickness.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 2 to 6. It ranges from 11 to 38 inches in thickness.

The Bt horizon has hue of 7.5YR to 2.5YR, value of 5 to 7, and chroma of 3 to 8. The lower part commonly is reticulately mottled in shades of gray, brown, red, or yellow, or it is gray and has brown, red, and yellow mottles. Mottles that have chroma of 0 to 2 are within a depth of 60 inches. The Bt horizon is generally fine sandy loam or sandy clay loam, but below the control section the range includes sandy clay. This horizon ranges from 20 to more than 40 inches in thickness. It extends to a depth of 80 inches or more.

The C or BC horizon, if it occurs, is sandy or loamy material. It is red, or it is mottled and has no dominant matrix color.

Boulogne Series

The Boulogne series consists of nearly level, poorly drained soils that formed in sandy marine deposits. These soils are in the flatwoods. Slopes range from 0 to 2 percent. The soils are sandy, siliceous, thermic Typic Haplaquods.

Boulogne soils are associated with Allanton, Evergreen, Hurricane, Kingsferry, Leon, Murville, Pottsburg, and Pottsburg, high, soils. Hurricane and Pottsburg, high, soils are in the higher positions on the landscape. Allanton, Evergreen, Kingsferry, and Murville soils are in the lower positions on the landscape. Evergreen soils and the depressional Leon soils are in small depressions. Other Leon soils and Pottsburg soils are in positions on the landscape similar to those of the Boulogne soils. They have an eluvial horizon.

Typical pedon of Boulogne sand (fig. 17), in a wooded area approximately 3.75 miles east-northeast of Macclenny, 1.1 miles south of U.S. Highway 90, 500 feet west and 1,700 feet north of the southeast corner of sec. 23, T. 2 S., R. 22 E.

Ap—0 to 6 inches; very dark gray (10YR 3/1) sand; moderate medium granular structure; very friable; many fine, common medium, and few coarse roots; extremely acid; smooth wavy boundary.

Bh—6 to 11 inches; dark brown (7.5YR 3/2) sand; weak fine granular structure; massive; very friable; common fine and few medium roots; sand grains coated with organic matter; very strongly acid; clear wavy boundary.

E1—11 to 17 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; common fine and few medium roots; extremely acid; gradual wavy boundary.

E2—17 to 30 inches; light brownish gray (10YR 6/2) sand; common medium distinct very pale brown (10YR 7/4) and few fine prominent strong brown (7.5YR 5/8) mottles; few fine prominent very dark grayish brown (10YR 3/2) streaks along old root channels; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

E3—30 to 38 inches; light gray (10YR 7/2) fine sand; many coarse prominent brown (7.5YR 5/4) and common medium distinct strong brown (7.5YR 5/8) mottles; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

E4—38 to 44 inches; grayish brown (10YR 5/2) fine sand; common medium prominent yellowish brown (10YR 5/6) mottles; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

BE—44 to 49 inches; dark brown (7.5YR 4/2) fine sand; common medium faint dark brown (7.5YR 3/2), weakly cemented fragments of ortstein; massive; very friable; few fine roots; very strongly acid; gradual wavy boundary.

B′h—49 to 59 inches; dark reddish brown (5YR 3/2) fine sand; common medium distinct black (5YR 2/1) streaks; massive; very friable; few fine roots; sand grains well coated with organic matter; very strongly acid; clear smooth boundary.

E′—59 to 66 inches; pinkish gray (7.5YR 6/2) fine sand; single grained; loose; very strongly acid; clear smooth boundary.

B″h—66 to 80 inches; black (5YR 2/1) fine sand; massive; friable; sand grains well coated with organic matter; very strongly acid.

The solum is more than 80 inches thick. Reaction is very strongly acid or strongly acid. The texture is sand or fine sand throughout the profile, except in the Bh horizon, which includes loamy fine sand or loamy sand.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It ranges from 6 to 14 inches in thickness. In some pedons an incipient E horizon about 2 inches thick is between the A and Bh horizons.

The Bh horizon has hue of 7.5YR, value of 3, and chroma of 2. It ranges from 2 to 10 inches in thickness.

The E horizon has hue of 10YR or 7.5YR, value of 4 to 7, and chroma of 1 or 2. It ranges from 10 to 40 inches in thickness.

The B′h and B″h horizons have hue of 7.5YR, value of 3, and chroma of 2 or hue of 5YR, value of 2 or 3, and chroma of 1 or 2. In some pedons, the B′h or B″h horizon is weakly cemented in more than half of the horizon and is very friable or friable in the upper part and firm or very firm in the lower part. Depth to a firm or very firm, weakly cemented B′h horizon is greater than 50 inches. This horizon extends to a depth of 80 inches or more. The E′ horizon separates the B′h and B″h horizons. It has the same colors and textures as the E horizon and is less than 10 inches thick.

Dasher Series

The Dasher series consists of nearly level, very poorly drained soils that formed in fibrous, hydrophytic, nonwoody plant remains. These soils are in depressions. They are dysic, thermic Typic Medihemists.

Dasher soils are associated with Mascotte and Pamlico soils. Mascotte and Pamlico soils are in positions on the landscape similar to those of the Dasher soils. Mascotte soils are of mineral origin. Pamlico soils have organic material 16 to 51 inches thick over sandy mineral deposits.

Typical pedon of Dasher mucky peat, depressional, in a wooded area approximately 23 miles north-northwest of Macclenny, 5 miles south of Florida Highway 2, 3,200 feet west and 4,200 feet north of the southeast corner of sec. 16, T. 1 N., R. 19 E.

Oe1—0 to 8 inches; black (5YR 2/1) mucky peat; about 70 percent fiber, mostly roots, 40 percent rubbed; massive; friable; many fine roots; extremely acid; gradual wavy boundary.

Oe2—8 to 70 inches; dark reddish brown (5YR 3/2) mucky peat; about 40 percent fiber, 25 percent rubbed; massive; very friable; few fine roots; extremely acid.

The organic material ranges from 51 to more than 80 inches in thickness. Reaction is extremely acid (0.01 molar calcium chloride) in the organic layers. It is strongly acid or very strongly acid in the Cg horizon, if it occurs.

The Oe horizon is neutral in hue and has value of 2 or 3, or it has hue of 10YR to 5YR, value of 2 or 3, and chroma of 1 to 3. The content of fiber, by volume, in the Oe2 horizon ranges from 25 to 65 percent unrubbed and from about 12 to 35 percent rubbed. The fibers that remain after rubbing are dominantly woody. This horizon extends to a depth of 51 inches or more.

The Cg horizon, if it occurs, is neutral in hue and has value of 3 to 5, or it has hue of 10YR, 2.5Y, or 5Y, value of 3 to 5, and chroma of 1 or 2. The texture is sand, fine sand, loamy fine sand, fine sandy loam, or sandy clay loam.

Dorovan Series

The Dorovan series consists of nearly level, very poorly drained soils that formed in fibrous, hydrophytic, nonwoody plant remains. These soils are on flood plains. They are dysic, thermic Typic Medisaprists.

Dorovan soils are associated with Mulat, Pamlico, and Surrency soils. Mulat, Pamlico, and Surrency soils are in positions on the landscape similar to those of the Dorovan soils. Mulat and Surrency soils are of mineral origin. Pamlico soils have organic material 16 to 51 inches thick over sandy mineral deposits.

Typical pedon of Dorovan muck, frequently flooded, in a wooded area approximately 7.5 miles southwest of Macclenny, 3.0 miles south of U.S. Highway 90, 200 feet north of County Road 130 and 80 feet east of the south prong of the St. Mary's River, 1,350 feet east and 200 feet north of the southwest corner of sec. 21, T. 3 S., R. 21 E.

Oa1—0 to 14 inches; black (10YR 2/1) muck; about 40 percent fiber, mostly roots, 10 percent rubbed; massive; friable; many fine roots; extremely acid; gradual wavy boundary.

Oa2—14 to 60 inches; black (10YR 2/1) muck; about 10 percent fiber, 5 percent rubbed; massive; very friable; few fine roots; extremely acid.

The organic material ranges from 51 to more than 80 inches thick. Reaction is extremely acid (0.01 molar calcium chloride) in the organic layers. Reaction is strongly acid or very strongly acid in the Cg horizon.

The Oa horizon is neutral in hue and has value of 2 or 3, or it has hue of 10YR to 5YR, value of 2 or 3, and chroma of 1 to 3. The content of fiber, by volume, is 10 to 40 percent unrubbed and less than about 16 percent rubbed. The fibers that remain after rubbing are dominantly woody. A few logs and large fragments of wood are typically in the lower part of the horizon. This horizon extends to a depth of 51 inches or more.

The Cg horizon, if it occurs, is neutral in hue and has value of 3 or 4, or it has hue of 10YR, 2.5Y, or 5Y, value of 3 to 5, and chroma of 1 or 2. It is sand, fine sand, loamy sand, sandy loam, fine sandy loam, or sandy clay loam.

Duplin Series

The Duplin series consists of gently sloping, moderately well drained soils that formed in loamy and clayey marine deposits. These soils are on narrow ridges and isolated knolls near drainageways. They are clayey, kaolinitic, thermic Aquic Paleudults.

Duplin soils are associated with Albany, Blanton, Bonneau, Leefield, Mascotte, Ocilla, Pelham, Penney, Plummer, Rains, Sapelo, and Troup soils. Blanton, Bonneau, Penney, and Troup soils are in the higher positions on the landscape. Bonneau, Penney, and Troup soils are on side slopes near drainageways. Mascotte, Pelham, Plummer, Rains, and Sapelo soils are in the lower positions on the landscape. Albany, Leefield, and Ocilla soils are in positions on the landscape similar to those of the Duplin soils. Albany soils have an argillic horizon at a depth of more than 40 inches. Leefield and Ocilla soils have an argillic horizon at a depth of 20 to 40 inches.

Typical pedon of Duplin loamy fine sand, 2 to 5 percent slopes, in a wooded area approximately 4.0 miles north-northwest of Macclenny, 0.9 mile west of

Florida Highway 125, 1,230 feet south and 1,800 feet east of the northwest corner of sec. 13, T. 3 S., R. 21 E.

Ap—0 to 4 inches; very dark grayish brown (10YR 3/2) loamy fine sand; weak medium granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

E—4 to 10 inches; dark brown (10YR 4/3) loamy fine sand; weak fine granular structure; very friable; common fine roots; moderately acid; clear smooth boundary.

Bt1—10 to 15 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium prominent red (10YR 4/8) and few fine prominent yellowish red (5YR 5/8) mottles; weak medium subangular structure; friable; few fine roots; sand grains bridged and coated with clay; moderately acid; clear wavy boundary.

Bt2—15 to 27 inches; yellowish brown (10YR 5/6) clay; common medium prominent yellowish red (5YR 5/8) and red (10R 4/6) and few medium distinct light yellowish brown (2.5YR 6/4) mottles; moderate medium subangular blocky structure; friable; few fine roots; sand grains bridged and coated with clay; clay skins on faces of peds; very strongly acid; gradual wavy boundary.

Btg1—27 to 44 inches; light brownish gray (10YR 6/2) sandy clay; common medium distinct brownish yellow (10YR 6/6) and few fine prominent strong brown (7.5YR 5/6) and red (10R 4/6) mottles; moderate medium subangular blocky structure; few fine roots; sand grains bridged and coated with clay; very strongly acid; gradual wavy boundary.

Btg2—44 to 70 inches; reticulately mottled light gray (10YR 7/2), yellow (10YR 7/6), red (10R 4/6 and 2.5YR 4/6), yellowish red (5YR 4/6), strong brown (7.5YR 5/6), and yellowish brown (10YR 5/6) sandy clay; weak very coarse subangular blocky structure; firm; sand grains bridged and coated with clay; very strongly acid.

The solum is more than 60 inches thick. Reaction ranges from very strongly acid to moderately acid throughout the profile.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. It ranges from 5 to 9 inches in thickness.

The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 to 6. It is less than 16 inches thick.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 8. Few or common low-chroma mottles, which are indicative of wetness, are within a depth of 30 inches. The Bt horizon is dominantly sandy clay or clay. It ranges from 11 to 18 inches in thickness.

The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It is sandy clay or clay.

The C horizon, if it occurs, has hue of 10YR to 5YR, value of 5 to 7, and chroma of 1 to 6. It has few to many prominent mottles. It is stratified sandy, loamy, and clayey coastal plain sediments.

Evergreen Series

The Evergreen series consists of nearly level, very poorly drained soils that formed in fibrous, hydrophytic, nonwoody plant remains over sandy marine deposits. These soils are in depressions in the flatwoods. They are sandy, siliceous, thermic Histic Haplaquods.

Evergreen soils are associated with Allanton, Boulogne, Kingsferry, Leon, Murville, and Pottsburg soils. Allanton, Boulogne, Kingsferry, Leon, Murville, and Pottsburg soils are in the higher positions on the landscape. The depressional Leon soils are in positions on the landscape similar to those of the Evergreen soils. They do not have a histic epipedon.

Typical pedon of Evergreen muck, in an area of Leon-Evergreen complex, depressional; in a forested area, approximately 6 miles west of Macclenny; 2 miles east of Florida Highway 121; 1,750 feet east and 100 feet north of the southwest corner of sec. 3, T. 2 S., R. 22 E.

Oa—0 to 14 inches; black (10YR 2/1) muck; about 30 percent fiber, 5 percent rubbed; weak coarse granular structure; very friable; common fine and medium and few coarse roots; extremely acid; gradual wavy boundary.

A—14 to 22 inches; black (10YR 2/1) fine sand; weak coarse granular structure; very friable; few fine, medium, and coarse roots; extremely acid; clear wavy boundary.

Eg1—22 to 28 inches; dark gray (10YR 4/1) fine sand; single grained; loose; few fine and medium roots; extremely acid; gradual wavy boundary.

Eg2—28 to 36 inches; gray (10YR 5/1) fine sand; common medium distinct dark gray (10YR 4/1) mottles; single grained; loose; few fine roots; very strongly acid; clear wavy boundary.

Eg3—36 to 40 inches; brown (10YR 4/2) fine sand; single grained; loose; very strongly acid; clear wavy boundary.

Bh1—40 to 50 inches; dark brown (7.5YR 3/2) fine sand; massive; friable; sand grains coated with organic matter; very strongly acid; clear wavy boundary.

Bh2—50 to 65 inches; dark reddish brown (5YR 3/2) fine sand; massive; friable; sand grains coated with organic matter; very strongly acid.

Reaction ranges from extremely acid to strongly acid throughout the profile.

The Oa horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The content of fiber is 10 to 33 percent unrubbed and less than 10 percent rubbed. The horizon ranges from 8 to 15 inches in thickness.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1. It is a mixture of uncoated sand grains and organic matter. It is sand or fine sand. It ranges from 4 to 8 inches in thickness.

The Eg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. It is sand or fine sand. It ranges from 2 to 20 inches in thickness.

The Bh horizon has hue of 5YR, value of 2 or 3, and chroma of 1 or 2 or hue of 7.5YR, value of 3, and chroma of 2. In some pedons it has few to many small, black, weakly cemented fragments of ortstein. The texture is fine sand, sand, loamy sand, or loamy fine sand. This horizon extends to a depth of 80 inches or more.

Hurricane Series

The Hurricane series consists of nearly level and gently sloping, somewhat poorly drained soils that formed in sandy marine deposits. These soils are on narrow to broad ridges and isolated knolls in the flatwoods. They are sandy, siliceous, thermic Grossarenic Entic Haplohumods.

Hurricane soils are associated with Albany, Boulogne, Leon, Mandarin, Ortega, Pottsburg, and Ridgewood soils. Ortega soils are in the higher positions on the landscape. Boulogne, Leon, and Pottsburg soils are lower on the landscape than the Hurricane soils. Albany and Ridgewood soils are in positions on the landscape similar to those of the Hurricane soils. Albany soils have an argillic horizon. Ridgewood soils do not have a spodic horizon.

Typical pedon of Hurricane sand, in an area of Hurricane and Ridgewood soils, 0 to 5 percent slopes; in a wooded area approximately 2.0 miles northeast of Macclenny; 0.7 mile north of U.S. Highway 90; 800 feet west and 1,000 feet south of the northeast corner of sec. 27, T. 2 S., R. 22 E.

A1—0 to 3 inches; dark gray (10YR 4/1) sand; weak fine granular structure; very friable; many fine and few medium roots; extremely acid; clear smooth boundary.

A2—3 to 8 inches; dark grayish brown (10YR 4/2) sand; common medium faint light gray (10YR 4/1) mottles; few medium prominent light gray (10YR 6/1) streaks; weak fine granular structure; very friable; common fine and medium and few coarse roots; extremely acid; gradual wavy boundary.

E1—8 to 16 inches; light yellowish brown (10YR 6/4) sand; common medium distinct gray (10YR 5/1) streaks; many medium distinct grayish brown (10YR 5/2) mottles; few fine prominent black (10YR 2/1) fragments of organic coated fine sand; single grained; loose; few fine and medium roots; extremely acid; gradual wavy boundary.

E2—16 to 24 inches; light yellowish brown (10YR 6/4) sand; few fine prominent strong brown (7.5YR 5/8) and few fine distinct grayish brown (10YR 5/2) mottles; single grained; loose; few fine and medium roots; extremely acid; gradual wavy boundary.

E3—24 to 35 inches; light yellowish brown (10YR 6/4) sand; common medium prominent strong brown (7.5YR 5/8), few fine prominent yellowish red (5YR 5/6), and common medium distinct light gray (10YR 7/2) mottles; single grained; loose; common fine and few medium roots; extremely acid; gradual wavy boundary.

E4—35 to 63 inches; white (10YR 8/2) sand; many medium prominent strong brown (7.5YR 5/8) and few fine prominent yellowish red (5YR 4/6) mottles; single grained; loose; few fine roots; extremely acid; gradual wavy boundary.

BE—63 to 74 inches; brown (7.5YR 5/2) sand; common medium distinct brown (7.5YR 5/4) mottles; single grained; loose; extremely acid; gradual wavy boundary.

Bh—74 to 80 inches; very dark gray (5YR 3/1) sand; massive; friable; sand grains coated with organic matter; extremely acid.

The solum is more than 60 inches thick. Depth to the Bh horizon ranges from 51 to 79 inches. Reaction ranges from moderately acid to very strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 2 to 6 inches in thickness.

The E horizon has hue of 10YR or 2.5Y and value of 4 to 7. It generally has chroma of 1 to 4, but chroma of 1 or 2 are common in the lower part. Few or common mottles in shades of gray, brown, yellow, and red, which are mostly indicative of wetness, are at a depth of 20 to 40 inches. The texture is sand or fine sand throughout the profile. The E horizon ranges from 45 to 66 inches in thickness.

The Bh horizon has hue of 10YR to 5YR, value of 2 to 5, and chroma of 1 or 2. It is fine sand, sand, or loamy sand.

Kershaw Series

The Kershaw series consists of gently sloping, excessively drained soils that formed in thick beds of sandy marine deposits. These soils are on high, broad ridges in the uplands. They are thermic, uncoated Typic Quartzipsamments.

Kershaw soils are associated with Ortega soils. Ortega soils are in the lower positions on the landscape and are moderately well drained.

Typical pedon of Kershaw sand, 2 to 5 percent slopes, in a wooded area approximately 2.6 miles east of Florida Highway 121, 2,100 feet north and 300 feet west of the southeast corner of sec. 3, T. 2 S., R. 22 E.

A—0 to 3 inches; dark grayish brown (10YR 4/2) sand; single grained; loose; many fine roots; very strongly acid; clear wavy boundary.

C1—3 to 21 inches; yellowish brown (10YR 5/4) sand; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

C2—21 to 62 inches; brownish yellow (10YR 6/6) sand; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

C3—62 to 80 inches; yellow (10YR 7/6) sand; single grained; loose; very strongly acid.

Reaction ranges from moderately acid to very strongly acid throughout the profile. The content of silt and clay at a depth of 10 to 40 inches is less than 5 percent, by weighted average.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 2 to 7 inches in thickness.

The upper part of the C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. In a few pedons, mottles in shades of white or light gray, which are not indicative of wetness, are at a depth of more than 40 inches. The texture is fine sand or sand throughout the profile.

Kingsferry Series

The Kingsferry series consists of nearly level, very poorly drained soils that formed in sandy marine deposits. These soils are on broad, low flats in the flatwoods. They are sandy, siliceous, thermic Arenic Umbric Haplaquods.

Kingsferry soils are associated with Allanton, Boulogne, Evergreen, Leon, Murville, Pottsburg, and Sapelo soils. Boulogne, Leon, Pottsburg, and Sapelo soils are in the higher positions on the landscape. Evergreen soils are in small depressions. Allanton and Murville soils are in positions on the landscape similar to those of the Kingsferry soils. Allanton soils have a spodic horizon at a depth of more than 50 inches. Murville soils have a spodic horizon within a depth of 30 inches.

Typical pedon of Kingsferry fine sand, in an area of Kingsferry and Allanton soils; in a wooded area approximately 4.0 miles northeast of Macclenny; 1.4 miles north of U.S. Highway 90; 700 feet east and 1,700 feet north of the southwest corner of sec. 24, T. 2 S., R. 22 E.

A1—0 to 7 inches; black (10YR 2/1) fine sand; moderate medium granular structure; very friable; many fine and medium and few coarse roots; extremely acid; clear smooth boundary.

A2—7 to 25 inches; mixed very dark gray (10YR 3/1) and gray (10YR 5/1) fine sand; common medium faint black (10YR 2/1) mottles; weak fine granular structure; very friable; few fine roots; very strongly acid; gradual wavy boundary.

A3—25 to 34 inches; very dark brown (10YR 3/2) fine sand; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

Bh1—34 to 43 inches; dark brown (7.5YR 3/2) fine sand; massive; very friable; few fine roots; sand grains coated with organic matter; very strongly acid; gradual wavy boundary.

Bh2—43 to 54 inches; very dark gray (5YR 3/1) fine sand; massive; friable; sand grains well coated with organic matter; few fine roots; very strongly acid; gradual wavy boundary.

Bh3—54 to 80 inches; black (5YR 2/1) fine sand; massive; firm; sand grains well coated with organic matter; very strongly acid.

The solum is more than 80 inches thick. Reaction ranges from strongly acid to extremely acid. Depth to the spodic horizon ranges from 30 to 50 inches. The texture is fine sand or sand throughout, except in the Bh horizon, which may include loamy sand or loamy fine sand.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1, or it is neutral in hue and has value of 2. It ranges from 20 to 38 inches in thickness. Some pedons have a very thin O horizon.

The Eg horizon, if it occurs, has hue of 10YR, value of 4 or 5, and chroma of 1 or 2 or hue of 7.5YR, value of 4, and chroma of 2. In a few pedons it has hue of 10YR, value of 4, and chroma of 3. The texture is sand or fine sand. The horizon is less than 12 inches thick.

The Bh horizon has hue of 5YR or 7.5YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. The upper part of the Bh horizon is very friable or friable. The lower part of the Bh horizon is weakly cemented in more than half of the horizon and is firm or very firm. Depth to the firm or very firm, weakly cemented part is more than 50 inches.

Leefield Series

The Leefield series consists of nearly level and gently sloping, somewhat poorly drained soils that formed in sandy and loamy marine deposits. These soils are on narrow to broad ridges and isolated knolls in the flatwoods. They are loamy, siliceous, thermic Arenic Plinthaquic Paleudults.

Leefield soils are associated with Albany, Blanton, Duplin, Ocilla, and Pelham soils. Blanton and Duplin soils are in the higher positions on the landscape. Duplin soils are near drainageways. Pelham soils are in the lower positions on the landscape. Albany and Ocilla soils are in positions on the landscape similar to those of the Leefield soils. Albany soils have an argillic horizon at a depth of more than 40 inches. Ocilla soils do not contain plinthite.

Typical pedon of Leefield fine sand, 0 to 5 percent slopes, in a wooded area approximately 2.75 miles south-southwest of Macclenny, 0.6 mile east of Florida Highway 121, 2,250 feet west and 300 feet north of the southeast corner of sec. 7, T. 3 S., R. 22 E.

Ap—0 to 10 inches; dark gray (10YR 4/1) fine sand; moderate medium granular structure; very friable; many fine roots; moderately acid; abrupt wavy boundary.

E1—10 to 22 inches; pale yellow (2.5YR 7/4) fine sand; single grained; loose; slightly acid; clear wavy boundary.

E2—22 to 28 inches; yellow (2.5Y 7/6) loamy fine sand; single grained; loose; slightly acid; clear wavy boundary.

Btv—28 to 35 inches; brownish yellow (10YR 6/6) fine sandy loam; many coarse prominent light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) and few medium prominent yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; friable; sand grains bridged and coated with clay; about 8 percent plinthite; strongly acid; clear wavy boundary.

Btg1—35 to 58 inches; light brownish gray (10YR 6/2) sandy clay loam; many coarse prominent yellowish brown (10YR 5/8) and few medium prominent red (10YR 4/8) mottles; moderate coarse subangular blocky structure; firm; sand grains bridged and coated with clay; very strongly acid; gradual wavy boundary.

Btg2—58 to 80 inches; reticulately mottled gray (10YR 5/1), yellowish brown (10YR 5/6), strong brown (7.5YR 5/8), and red (10YR 4/6) sandy clay loam; weak coarse subangular blocky structure; firm; sand grains bridged and coated with clay; very strongly acid.

The solum is more than 60 inches thick. The depth to horizons that have 5 to 20 percent plinthite ranges from 30 to 60 inches. Mottles that have chroma of 0 to 2 are within a depth of 30 inches. Reaction is strongly acid or very strongly acid, except in areas that have been limed.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 4 to 10 inches in thickness.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. Few or common mottles in shades of gray, brown, yellow, and red, which are generally indicative of wetness, are at a depth of 18 to 30 inches. The texture is fine sand or loamy fine sand throughout the profile. The E horizon ranges from 17 to 33 inches in thickness.

The Btv horizon has hue of 10YR or 2.5Y, value of 6, and chroma of 4 to 6. Few or common mottles in shades of gray, brown, and yellow are throughout the horizon. The content of plinthite is 5 to 10 percent. The Btv horizon is fine sandy loam or sandy clay loam. It is less than 13 inches thick.

The Btvg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Few or common brown and yellow mottles are throughout the horizon. The content of plinthite is 5 to 20 percent. The Btvg horizon is fine sandy loam or sandy clay loam. It is less than 16 inches thick.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Few or common brown and yellow mottles are throughout the horizon. The texture is fine sandy loam or sandy clay loam.

Leon Series

The Leon series consists of nearly level, poorly drained soils that formed in sandy marine deposits. These soils are in the flatwoods, on flood plains, and in depressions. Slopes range from 0 to 2 percent. The soils are sandy, siliceous, thermic Aeric Haplaquods.

Leon soils are associated with Allanton, Boulogne, Evergreen, Hurricane, Kingsferry, Mandarin, Pottsburg, Pottsburg, high, Ridgewood, and Sapelo soils. Hurricane, Mandarin, Pottsburg, high, and Ridgewood soils are in the higher positions on the landscape. Allanton, Evergreen, and Kingsferry soils are in the lower positions on the landscape. Boulogne, Pottsburg, and Sapelo soils are in positions on the landscape similar to those of the Leon soils. Boulogne soils do not have an eluvial horizon. Pottsburg soils have a spodic horizon at a depth of more than 50 inches. Sapelo soils have an argillic horizon at a depth of more than 40 inches.

Typical pedon of Leon sand, in a wooded area approximately 2.0 miles east of Macclenny, 2.4 miles south of U.S. Highway 90, 1,950 feet west and 400 feet north of the southeast corner of sec. 11, T. 3 S., R. 22 E.

A—0 to 7 inches; sand, dark gray (10YR 4/1) and black (10YR 2/1) rubbed; moderate fine granular structure; very friable; many medium and fine and few large roots; very strongly acid; gradual smooth boundary.

E—7 to 17 inches; light gray (10YR 7/1) sand; single grained; loose; common medium and fine roots; very strongly acid; clear wavy boundary.

Bh1—17 to 23 inches; dark reddish brown (5YR 2/2) loamy sand; massive; firm; many fine roots; very strongly acid; gradual wavy boundary.

Bh2—23 to 26 inches; very dark grayish brown (10YR 3/2) sand; massive; friable; few fine roots; very strongly acid; gradual wavy boundary.

BE—26 to 31 inches; yellowish brown (10YR 5/4) sand; few medium distinct very dark grayish brown (10YR 3/2) mottles; massive; very friable; very strongly acid; gradual wavy boundary.

Eg—31 to 47 inches; light gray (10YR 7/2) sand; single grained; loose; very strongly acid; gradual wavy boundary.

B'h1—47 to 60 inches; black (10YR 2/1) sand; common medium distinct grayish brown (10YR 5/2) and common fine faint very dark gray (10YR 3/1) mottles; massive; friable; very strongly acid; gradual wavy boundary.

B'h2—60 to 80 inches; black (N 2/0) sand; massive; friable; very strongly acid.

The texture is sand or fine sand throughout, except in the Bh horizon, which includes loamy sand or loamy fine sand. Reaction is very strongly acid or strongly acid throughout, except in areas that have been limed. Depth to the Bh horizon is less than 30 inches.

The Oa horizon, if it occurs, has hue of 10YR to 5YR, value of 2 or 3, and chroma of 1 or 2. The content of fiber is 10 to 30 percent unrubbed and less than 10 percent rubbed. The horizon is less than 8 inches thick.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1. It ranges from 2 to 9 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It ranges from 4 to 22 inches in thickness.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3. In some pedons, 15 to 25 percent of this horizon is weakly cemented. The horizon has vertical or horizontal streaks or pockets of gray or light gray. It ranges from 6 to 35 inches in thickness.

The BE horizon, if it occurs, has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 3 or 4. In some pedons it has mottles of gray, brown, or yellow. It is less than 10 inches thick.

The Eg horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 1 or 2. It is less than 36 inches thick.

The B'h horizon, if it occurs, has colors and textures similar to those of the Bh horizon.

Some pedons do not have a bisequum of Eg and B'h horizons but have a C horizon with hue of 7.5YR or 10YR, value of 4 to 8, and chroma of 1 to 4.

Mandarin Series

The Mandarin series consists of nearly level, somewhat poorly drained soils that formed in sandy marine deposits. These soils are on narrow ridges and isolated knolls in the slightly higher flatwoods. They are sandy, siliceous, thermic Typic Haplohumods.

Mandarin soils are associated with Allanton, Hurricane, Leon, Ortega, Pottsburg, Pottsburg, high, and Ridgewood soils. Hurricane, Ortega, Pottsburg, high, and Ridgewood soils are in the higher positions on the landscape. Allanton, Leon, and Pottsburg soils are in the lower positions on the landscape.

Typical pedon of Mandarin sand, in a wooded area approximately 5.3 miles north-northeast of Macclenny, 50 feet south of Radio Avenue, 2.75 miles east of Florida Highway 121, 1,000 feet east and 1,600 feet north of the southwest corner of sec. 2, T. 2 S., R. 22 E.

Ap—0 to 4 inches; dark gray (10YR 4/1) sand; weak medium granular structure; very friable; many fine roots; extremely acid; clear smooth boundary.

E—4 to 24 inches; gray (10YR 6/1) sand; single grained; loose; common fine roots; extremely acid; gradual irregular boundary.

Bh/E—24 to 27 inches; dark reddish brown (5YR 2/2) sand (Bh); about 40 percent intrusions of light gray (10YR 7/1) sand (E) extending from the horizon above; massive; friable; sand grains well coated with organic matter in the Bh part; few fine roots; extremely acid; clear irregular boundary.

Bh1—27 to 29 inches; dark reddish brown (5YR 3/3) sand; about 30 percent intrusions of light gray (10YR 7/1) fine sand with dark reddish brown (5YR 2/2) between the tongues and the matrix; massive; friable; sand grains coated with organic matter; extremely acid; gradual irregular boundary.

Bh2—29 to 32 inches; dark reddish brown (5YR 3/4) sand; about 20 percent intrusions of light gray (10YR 7/1) fine sand with dark reddish brown (5YR 2/2 and 3/2) between the tongues and the matrix; massive; friable; sand grains coated with organic matter; extremely acid; gradual wavy boundary.

BE1—32 to 37 inches; reddish brown (5YR 4/3) sand; single grained; loose; extremely acid; gradual wavy boundary.

BE2—37 to 45 inches; yellowish brown (10YR 5/4) sand; single grained; loose; extremely acid; gradual wavy boundary.

E'1—45 to 63 inches; light brownish gray (10YR 6/2) sand; single grained; loose; extremely acid; gradual wavy boundary.

E'2—63 to 70 inches; grayish brown (10YR 5/2) sand; single grained; loose; extremely acid; gradual wavy boundary.

B'h—70 to 80 inches; black (10YR 2/1) sand; massive; very friable; sand grains coated with organic matter; very strongly acid.

Reaction ranges from extremely acid to moderately acid in the surface layer, except in areas that have been limed. Depth to the Bh horizon is less than 30 inches. The texture is sand or fine sand throughout the profile, except in the Bh horizon, which includes loamy sand or loamy fine sand.

The A horizon has hue of 10YR, value of 2 to 6, and chroma of 1, or it is neutral in hue and has value of 3 to 5. It ranges from 2 to 7 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. It ranges from 10 to 24 inches in thickness.

The Bh horizon has hue of 5YR, value of 2 or 3, and chroma of 1 to 4 or hue of 7.5YR, value of 3, and chroma of 2. In some pedons, 30 to 45 percent of this horizon is weakly cemented. Sand grains are well coated with organic matter. The Bh horizon ranges from 4 to 10 inches in thickness.

The BE horizon or the EB horizon, if it occurs, 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. It is less than 32 inches thick.

The E' horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. It is less than 30 inches thick.

The B'h horizon has the same colors as the Bh horizon. It extends to a depth of more than 80 inches.

The C horizon, if it occurs, has hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 1 to 3.

Mascotte Series

The Mascotte series consists of nearly level, poorly drained soils that formed in sandy and loamy marine deposits. These soils are in the flatwoods. They are sandy, siliceous, thermic Ultic Haplaquods.

Mascotte soils are associated with Albany, Duplin, Leefield, Mulat, Ocilla, Olustee, Pelham, Plummer, Rains, Sapelo, and Surrency soils. Albany, Duplin, Leefield, and Ocilla soils are in the higher positions on the landscape. Duplin soils are near drainageways. Pelham, Plummer, Rains, and Surrency soils are in the lower positions on the landscape. Olustee and Sapelo soils are in positions on the landscape similar to those of the Mascotte soils. Sapelo soils have an argillic horizon at a depth of more than 40 inches. Olustee soils do not have an eluvial horizon.

Typical pedon of Mascotte fine sand, in a wooded area approximately 14.5 miles west-southwest of Macclenny, 1.6 mile south of U.S. Highway 90, 1,800 feet east and 1,000 feet north of the southwest corner of sec. 30, T. 2 S., R. 20 E.

A—0 to 6 inches; black (10YR 2/1) fine sand; moderate medium granular structure; very friable; many fine and medium and common coarse roots; very strongly acid; clear smooth boundary.

E—6 to 18 inches; light gray (10YR 6/1) fine sand; single grained; loose; common fine and few medium and coarse roots; strongly acid; clear wavy boundary.

Bh1—18 to 20 inches; black (10YR 2/1) fine sand; massive; friable; common fine and few medium and coarse roots; sand grains well coated with organic matter; strongly acid; gradual wavy boundary.

Bh2—20 to 24 inches; dark reddish brown (2.5YR 3/4) fine sand; thin bands of dark brown (7.5YR 4/4) in the lower part; massive; firm; less than 25 percent is weakly cemented; few fine roots; sand grains coated with organic matter; very strongly acid; clear wavy boundary.

BE—24 to 29 inches; light yellowish brown (10YR 6/4) fine sand; few fine prominent dark brown (7.5YR 4/4) and common medium prominent dark brown (10YR 4/3) mottles; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

E'—29 to 38 inches; light gray (10YR 7/2) fine sand; few fine prominent yellowish brown (10YR 5/6) mottles; single grained; loose; few fine roots; very strongly acid; abrupt wavy boundary.

Btg1—38 to 52 inches; gray (10YR 6/1) fine sandy loam; many coarse prominent light yellowish brown (10YR 6/4), common medium prominent strong brown (7.5YR 5/8), and few fine prominent red (2.5YR 4/6) mottles; weak fine subangular blocky structure; friable; few fine roots; sand grains bridged and coated with clay; very strongly acid; clear wavy boundary.

Btg2—52 to 56 inches; grayish brown (10YR 5/2) loamy fine sand; common medium distinct gray (7.5YR 5/2) and few medium prominent strong brown (7.5YR 5/8) mottles; massive; friable; sand grains

Figure 16.—Typical profile of Blanton fine sand, moderately wet, 0 to 5 percent slopes. Depth is marked in meters and feet.

Figure 17.—Typical profile of Boulogne sand. Depth is marked in meters and feet.

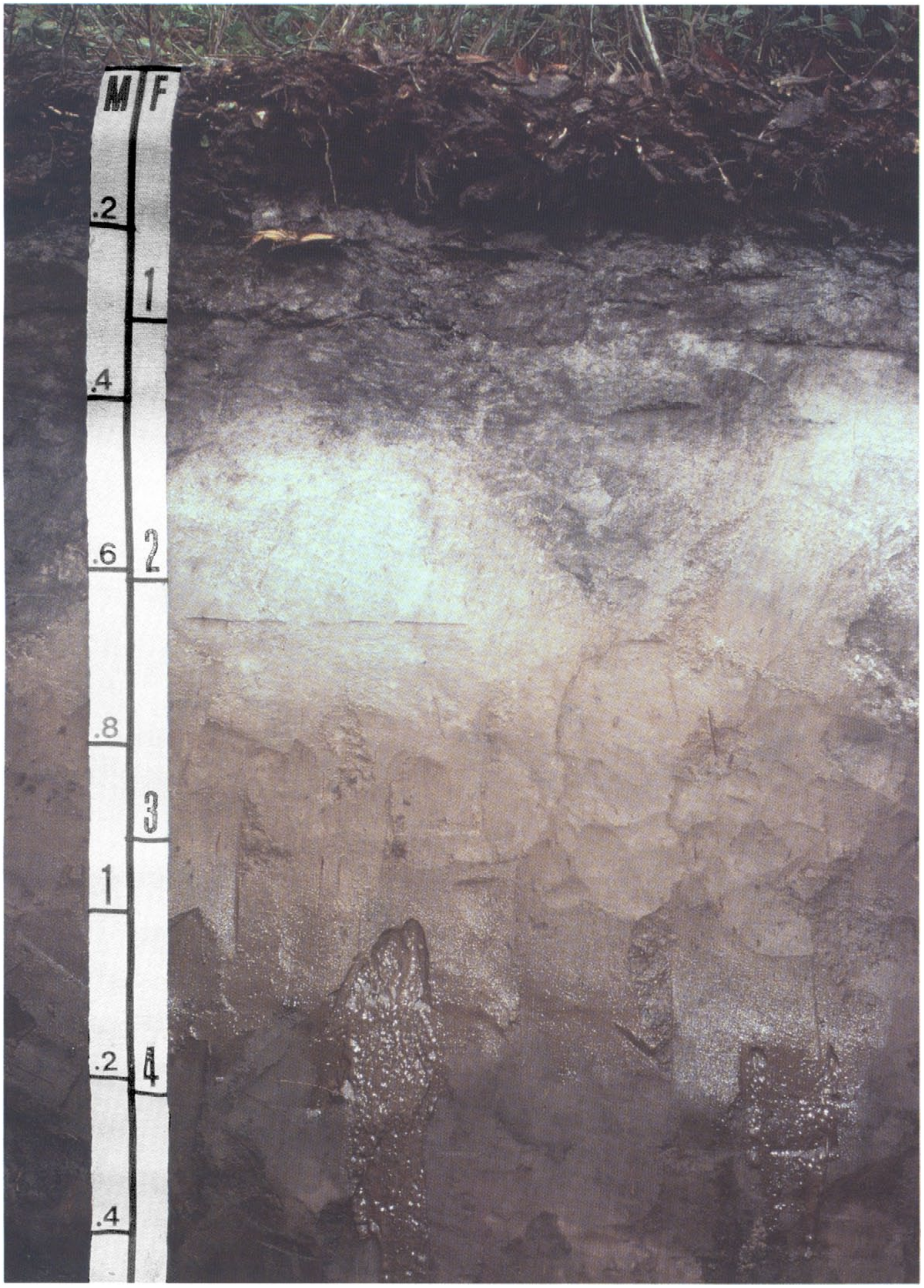

Figure 18.—Typical profile of Pottsburg sand. Depth is marked in meters and feet.

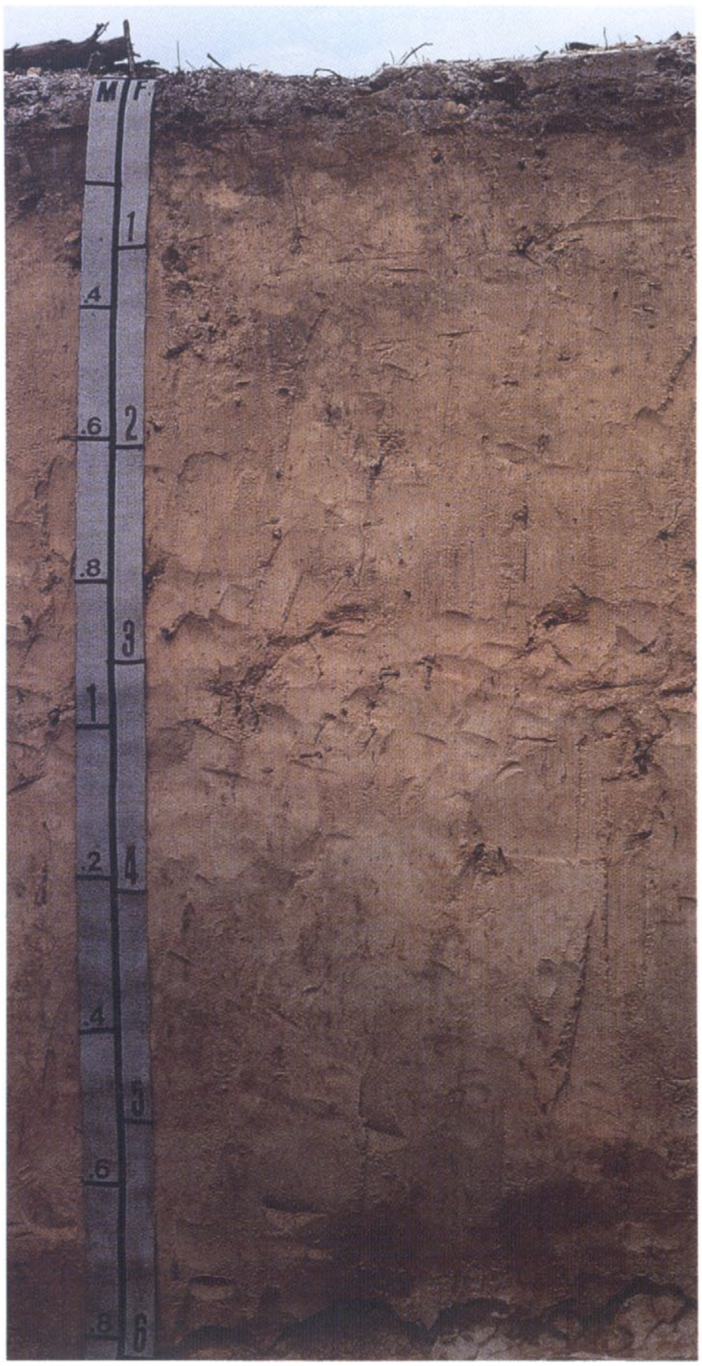

Figure 19.—Typical profile of Ridgewood fine sand, in an area of Hurricane and Ridgewood soils, 0 to 5 percent slopes. Depth is marked in meters and feet.

Figure 20.—Typical profile of Sapelo fine sand. Depth is marked in meters and feet.

Figure 21.—Typical profile of Troup fine sand, in an area of Troup-Bonneau-Penney complex, 5 to 8 percent slopes. Depth is marked in meters and feet.

bridged and coated with clay; very strongly acid; gradual wavy boundary.

Cg—56 to 80 inches; grayish brown (10YR 5/2) fine sand; few fine prominent strong brown (7.5YR 5/8) streaks along root channels and thin lenses of gray (10YR 7/1); massive; friable; very strongly acid.

Depth to the Bh horizon ranges from 10 to 30 inches. Depth to the Bt horizon ranges from 24 to 40 inches. Reaction ranges from extremely acid to strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1. It ranges from 3 to 9 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It ranges from 5 to 16 inches in thickness.

The Bh horizon has hue of 2.5YR to 10YR, value of 2 or 3, and chroma of 1 to 3; has hue of 2.5YR to 7.5YR, value of 3 or 4, and chroma of 4; or is neutral in hue and has value of 2. In some pedons, 15 to 25 percent of this horizon is weakly cemented. The Bh horizon is fine sand or loamy fine sand. It ranges from 5 to 20 inches in thickness.

The BE horizon has hue of 10YR, value of 3 to 6, and chroma of 3. In some pedons it contains fragments of ortstein. It is less than 11 inches thick.

The E′ horizon, if it occurs, has hue of 10YR, value of 5 to 7, and chroma of 1 or 2, or it has hue of 2.5Y, value of 5 to 7, and chroma of 2. In some pedons it has mottles in shades of brown and gray. It is less than 8 inches thick.

The Btg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2; has hue of 2.5Y, value of 5 or 6, and chroma of 2; or is neutral in hue and has value of 4 to 7. It has mottles in shades of yellow, brown, and red. It is fine sandy loam or sandy clay loam. The content of clay is generally about 18 to 23 percent, but it ranges from 14 to 35 percent. This horizon ranges from 10 to 43 inches in thickness. In many pedons it extends to a depth of 80 inches or more.

The Cg horizon, if it occurs, has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It is fine sand or loamy fine sand.

Mulat Series

The Mulat series consists of nearly level, poorly drained soils that formed in sandy and loamy marine deposits. These soils are on flood plains. They are loamy, siliceous, thermic Arenic Ochraquults.

Mulat soils are associated with Dorovan, Mascotte, Olustee, Osier, Ousley, Pelham, Plummer, Rains, Sapelo, and Surrency soils. Mascotte, Olustee, Ousley, Pelham, Plummer, Rains, and Sapelo soils are in the higher positions on the landscape. Dorovan, Surrency, and Osier soils are in positions on the landscape similar to those of the Mulat soils. Dorovan soils are very poorly drained. They are organic. Surrency soils have an argillic horizon that extends to a depth of more than 60 inches. Osier soils are sandy throughout.

Typical pedon of Mulat mucky fine sand, in an area of Surrency-Mulat complex, frequently flooded; in a wooded area approximately 6.5 miles north-northeast of Macclenny; 2.5 miles east of Florida Highway 121; 2,200 feet east and 1,000 feet north of the southwest corner of sec. 35, T. 1 S., R. 21 E.

A—0 to 6 inches; very dark gray (10YR 3/1) mucky fine sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; gradual wavy boundary.

Eg—6 to 28 inches; gray (10YR 5/1) fine sand; single grained; loose; common fine roots; strongly acid; clear wavy boundary.

Btg—28 to 55 inches; dark gray (10YR 4/1) sandy clay loam; weak coarse subangular blocky structure; friable; sand grains bridged and coated with clay; strongly acid; clear wavy boundary.

Cg—55 to 80 inches; dark gray (10YR 4/1) loamy fine sand; single grained; loose; strongly acid.

The solum is more than 40 inches thick. Depth to the argillic horizon ranges from 20 to 40 inches. Reaction is strongly acid or very strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It ranges from 4 to 7 inches in thickness.

The Eg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. It is fine sand or loamy fine sand. It ranges from 14 to 32 inches in thickness.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 2. It is fine sandy loam or sandy clay loam. It ranges from 12 to 25 inches in thickness.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It is fine sand, sand, or loamy fine sand.

Murville Series

The Murville series consists of nearly level, very poorly drained soils that formed in sandy marine deposits. These soils are on broad, low flats in the flatwoods. They are sandy, siliceous, thermic Typic Haplaquods.

Murville soils are associated with Allanton, Boulogne, Evergreen, Kingsferry, and Leon soils. Boulogne and Leon soils are in the higher positions on the landscape. Evergreen soils are in the lower positions on the landscape. Allanton and Kingsferry soils are in positions on the landscape similar to those of the Murville soils. Allanton soils have a spodic horizon at a depth of more than 50 inches.

Typical pedon of Murville fine sand, in a wooded area approximately 8.5 miles south-southeast of Macclenny, 2 miles north of Florida Highway 228, 3,150 feet east and 500 feet north of the southwest corner of sec. 1, T. 4 S., R. 22 E.

A—0 to 10 inches; black (10YR 2/1) fine sand; moderate medium granular structure; very friable; many fine, common medium, and few coarse roots; extremely acid; clear wavy boundary.

Bh1—10 to 35 inches; dark reddish brown (5YR 2/2) fine sand; common medium faint black (5YR 2/1), weakly cemented fragments of ortstein; massive; friable; sand grains well coated with organic matter; few fine roots; very strongly acid; gradual wavy boundary.

Bh2—35 to 42 inches; dark brown (7.5YR 3/2) fine sand; massive; firm; sand grains coated with organic matter; very strongly acid; clear wavy boundary.

BE—42 to 60 inches; dark brown (10YR 4/3) fine sand; single grained; loose; very strongly acid; gradual wavy boundary.

B′h1—60 to 70 inches; dark reddish brown (5YR 2/2) fine sand; massive; friable; sand grains coated with organic matter; very strongly acid; clear wavy boundary.

B′h2—70 to 80 inches; black (5YR 2/1) fine sand; massive; friable; sand grains coated with organic matter; very strongly acid.

Reaction ranges from extremely acid to strongly acid, except in areas that have been limed. The texture is generally fine sand, but in the Bh horizon it can include loamy fine sand. Some pedons have a very thin O horizon.

The A horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2, or it is neutral in hue and has value of 1. Some pedons have a thin E horizon.

The Bh horizon has hue of 5YR to 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It ranges from 8 to 35 inches in thickness.

The BE horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is less than 20 inches thick.

The Eg horizon, if it occurs, has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1 or 2. It is less than 20 inches thick.

The B′h horizon, if it occurs, has colors and textures similar to those of the Bh horizon. It is below the BE or Eg horizon.

Ocilla Series

The Ocilla series consists of nearly level and gently sloping, somewhat poorly drained soils that formed in sandy and loamy marine deposits. These soils are on narrow to broad ridges and isolated knolls in the flatwoods. Slopes range from 0 to 5 percent. The soils are loamy, siliceous, thermic Aquic Arenic Paleudults.

Ocilla soils are associated with Albany, Blanton, Bonneau, Duplin, Leefield, Mascotte, Olustee, Pelham, Penney, Plummer, Rains, Sapelo, and Troup soils. Blanton, Bonneau, Duplin, Penney, and Troup soils are in the higher positions on the landscape. Duplin soils are near drainageways, and Penney and Troup soils are on side slopes. Mascotte, Olustee, Pelham, Plummer, Rains, and Sapelo soils are in the lower positions on the landscape. Albany and Leefield soils are in positions on the landscape similar to those of the Ocilla soils. Albany soils have an argillic horizon at a depth of more than 40 inches. Leefield soils contain plinthite.

Typical pedon of Ocilla fine sand, 0 to 3 percent slopes, in a wooded area approximately 3 miles southwest of Macclenny, 0.9 mile south of Florida Highway 121, 700 feet east and 150 feet south of the northwest corner of sec. 18, T. 3 S., R. 22 E.

Ap—0 to 9 inches; dark gray (10YR 4/1) fine sand; moderate medium granular structure; very friable; common fine roots; strongly acid; abrupt smooth boundary.

E—9 to 22 inches; very pale brown (10YR 7/3) fine sand; common medium faint grayish brown (10YR 5/2) and few fine prominent strong brown (7.5YR 5/8) mottles; single grained; loose; few fine roots; strongly acid; clear wavy boundary.

BE—22 to 26 inches; yellow (2.5Y 6/6) loamy fine sand; common medium distinct yellowish brown (10YR 5/8) mottles; single grained; loose; few fine roots; very strongly acid; abrupt wavy boundary.

Btg1—26 to 32 inches; light brownish gray (10YR 6/2) fine sandy loam; common fine prominent strong brown (7.5YR 5/8) and few fine prominent red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; friable; few fine roots; sand grains bridged and coated with clay; very strongly acid; clear wavy boundary.

Btg2—32 to 41 inches; light brownish gray (10YR 6/2) sandy clay loam; many coarse prominent yellowish brown (10YR 5/6) and few fine prominent red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; friable; sand grains bridged and coated with clay; extremely acid; gradual wavy boundary.

Btg3—41 to 58 inches; gray (10YR 5/1) sandy clay loam; common medium prominent yellowish brown (10YR 5/6) and few fine prominent red (2.5YR 4/6) mottles; weak very coarse subangular blocky structure; friable; sand grains bridged and coated with clay; very strongly acid; gradual wavy boundary.

Btg4—58 to 80 inches; gray (10YR 5/1) sandy clay loam; common medium prominent red (2.5Y 4/8) and few fine distinct yellowish brown (10YR 5/4) mottles; massive; friable; weak very coarse subangular blocky structure; sand grains bridged and coated with clay; very strongly acid.

The solum ranges from 68 to more than 80 inches in thickness. Reaction ranges from moderately acid to extremely acid throughout the profile, except in areas that have been limed.

The A horizon has hue of 10YR or is neutral in hue. It has value of 3 to 5 and chroma of 0 to 2. If value is 3.5 or less, the horizon is less than 7 inches thick. The thickness of the A horizon ranges from 3 to 10 inches.

The E horizon has hue of 10YR, value of 4 to 7, and chroma of 1 to 4 or hue of 2.5Y, value of 5 to 8, and chroma of 2 to 4. In some pedons the lower part of the E horizon has mottles in shades of brown, olive, or gray. The E horizon is fine sand or loamy fine sand. It ranges from 16 to 32 inches in thickness.

The BE horizon has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 3 to 8. It has mottles in shades of gray, yellow, brown, and red. It is loamy fine sand. It is less than 14 inches thick.

The Bt horizon, if it occurs, has hue of 2.5Y, value of 6 or 7, and chroma of 4 to 6 or hue of 10YR, value of 5 to 7, and chroma of 2 to 6. It has mottles in shades of gray, yellow, brown, and red. The texture is dominantly sandy clay loam, but it ranges from fine sandy loam to sandy clay.

The Btg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 5 to 7 and chroma of 0 to 2. The content of plinthite is less than 5 percent. The texture is dominantly sandy clay loam, but it ranges from fine sandy loam to sandy clay. Some subhorizons have pockets of fine sandy loam. The content of clay in the upper 20 inches of the argillic horizon ranges from 18 to 35 percent, by weighted average.

Olustee Series

The Olustee series consists of nearly level, poorly drained soils that formed in sandy and loamy marine deposits in the flatwoods. These soils are sandy, siliceous, thermic Ultic Haplaquods.

Olustee soils are associated with Albany, Mascotte, Mulat, Ocilla, Pelham, Sapelo, and Surrency soils. Albany and Ocilla soils are in the higher positions on the landscape. Mulat and Surrency soils are in the lower positions on the landscape. Mascotte, Pelham, and Sapelo soils are in positions on the landscape similar to those of the Olustee soils. Pelham soils do not have a spodic horizon. Sapelo soils have an eluvial horizon and an argillic horizon at a depth of more than 40 inches. Mascotte soils have a substantial eluvial horizon.

Typical pedon of Olustee fine sand, in an area of Olustee-Pelham complex; in a wooded area approximately 3.5 miles south-southeast of Macclenny; 0.4 mile west of Florida Highway 121; 3,050 feet west and 3,500 feet north of the southeast corner of sec. 18, T. 3 S., R. 22 E.

A—0 to 8 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; many fine and few medium roots; very strongly acid; clear irregular boundary.

Bh—8 to 14 inches; dark brown (7.5YR 3/2) fine sand; weak fine granular structure; friable; common fine and few medium roots; strongly acid; gradual irregular boundary.

Eg1—14 to 27 inches; light gray (10YR 7/2) fine sand; many coarse distinct grayish brown (10YR 5/2) mottles; few medium prominent dark brown (7.5YR 3/2), weakly cemented fragments of ortstein; few fine prominent strong brown (7.5YR 5/8) streaks along root channels; single grained; loose; few fine roots; few medium ironstone pebbles; strongly acid; clear wavy boundary.

Eg2—27 to 37 inches; light gray (10YR 7/2) fine sand; few fine prominent strong brown (7.5YR 5/8) streaks along root channels; single grained; loose; strongly acid; gradual wavy boundary.

Btg—37 to 57 inches; light brownish gray (10YR 6/2) fine sandy loam; many coarse prominent yellowish brown (10YR 5/8) and few fine prominent red (2.5YR 4/6) mottles; weak coarse subangular blocky structure; friable; sand grains are coated and bridged with clay; very strongly acid; gradual wavy boundary.

Cg—57 to 80 inches; reticulately mottled gray (10YR 6/1), strong brown (7.5YR 5/8), and red (2.5YR 4/6 and 10R 4/6) fine sandy loam; massive; firm; very strongly acid.

The solum is more than 50 inches thick. Depth to the Bt horizon ranges from 24 to 40 inches. Reaction ranges from extremely acid to strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It ranges from 4 to 9 inches in thickness.

Some pedons have an incipient E horizon between the A and Bh horizons. This horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. It is less than 2 inches thick.

The Bh horizon has hue of 5YR or 7.5YR, value of 2 or 3, and chroma of 1 to 4 or hue of 10YR, value of 2 or 3, and chroma of 1 to 3. It is sand or fine sand. It ranges from 4 to 10 inches in thickness.

The BE horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3. In some pedons it contains weakly cemented fragments of ortstein. It is sand or fine sand. It is less than 10 inches thick.

The Eg horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 or 2. In some pedons it has mottles in shades of yellow, brown, or black. It is sand or fine sand. It ranges from 6 to 30 inches in thickness.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. It has mottles in shades of yellow, brown, and red. It is fine sandy loam, sandy loam, or sandy clay loam. The content of clay ranges from about 18 to 35 percent. The Btg horizon generally ranges from 10 to 30 inches in thickness, but in many pedons it extends to a depth of more than 80 inches.

The Cg horizon, if it occurs, has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. It ranges from sand to sandy clay.

Ortega Series

The Ortega series consists of nearly level and gently sloping, moderately well drained soils that formed in sandy marine deposits. These soils are on narrow to broad ridges and isolated knolls. They are thermic, uncoated Typic Quartzipsamments.

Ortega soils are associated with Hurricane, Kershaw, Mandarin, Penney, Ridgewood, and Troup soils. Kershaw, Penney, and Troup soils are in the higher positions on the landscape. Penney and Troup soils are on side slopes. Hurricane, Mandarin, and Ridgewood soils are in the lower positions on the landscape.

Typical pedon of Ortega sand, 0 to 5 percent slopes, in a wooded area, approximately 2.0 miles east of Macclenny, 0.7 mile north of U.S. Highway 90, 400 feet east and 1,300 feet south of the northwest corner of sec. 27, T. 2 S., R. 22 E.

A1—0 to 3 inches; dark gray (10YR 4/1) sand; weak fine granular structure; very friable; many fine and common medium roots; extremely acid; abrupt smooth boundary.

A2—3 to 6 inches; grayish brown (10YR 4/2) sand; common medium distinct brown (10YR 5/3) streaks; single grained; loose; many fine roots; extremely acid; gradual wavy boundary.

C1—6 to 41 inches; light yellowish brown (10YR 6/4) sand; single grained; loose; few fine, medium, and coarse roots; extremely acid; gradual wavy boundary.

C2—41 to 55 inches; light yellowish brown (10YR 6/4) sand; common fine distinct light brownish gray (10YR 6/2) and few prominent strong brown (7.5YR 5/8) mottles; single grained; loose; few fine and medium roots; extremely acid; gradual wavy boundary.

C3—55 to 67 inches; very pale brown (10YR 7/3) sand; many medium distinct light gray (10YR 7/2), few medium prominent strong brown (7.5YR 5/8), and few fine prominent yellowish red (5YR 4/6) mottles; single grained; loose; few fine roots; extremely acid; gradual wavy boundary.

C4—67 to 80 inches; very pale brown (10YR 7/3) sand; many coarse distinct light gray (10YR 7/2) and common medium distinct grayish brown (10YR 5/2) mottles along root channels; single grained; loose; few fine roots; extremely acid.

Reaction ranges from extremely acid to moderately acid. The texture is sand or fine sand. The content of silt and clay at a depth of 10 to 40 inches is less than 5 percent, by weighted average.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 1 to 6 inches in thickness.

The upper part of the C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. In many pedons it has white or light gray uncoated sand grains, which are not indicative of wetness. Few or common mottles in shades of reddish yellow, strong brown, and yellowish brown, which are generally indicative of wetness, are at a depth of 40 to 60 inches. The texture is fine sand or sand. The upper part of the C horizon ranges from 45 to 60 inches in thickness.

The lower part of the C horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2. It has mottles in shades of red, yellow, gray, or white. It is fine sand or sand.

Osier Series

The Osier series consists of nearly level, poorly drained soils that formed in sandy fluvial deposits. These soils are on flood plains. They are siliceous, thermic Typic Psammaquents.

Osier soils are associated with Leon, Mulat, Ousley, and Surrency soils. Leon, Mulat, and Surrency soils are in positions on the landscape similar to those of the Osier soils. Mulat and Surrency soils have an argillic horizon. The somewhat poorly drained Ousley soils are on low terraces adjacent to flood plains.

Typical pedon of Osier fine sand, frequently flooded, on a flood plain approximately 1.9 miles southeast of Macclenny, 1.1 miles west of U.S. Highway 90, 750 feet east and 2,400 feet north of the southwest corner of sec. 6, T. 3 S., R. 22 E.

A—0 to 6 inches; very dark gray (10YR 3/1) fine sand; moderate medium granular structure; very friable; many fine, medium, and coarse roots; extremely acid; abrupt smooth boundary.
Cg1—6 to 16 inches; light brownish gray (10YR 6/2) fine sand; common medium prominent very dark gray (10YR 3/1) streaks; single grained; loose; many fine and few medium roots; extremely acid; abrupt smooth boundary.
Cg2—16 to 50 inches; white (10YR 8/1) fine sand; common medium prominent very dark gray (10YR 3/1) streaks; single grained; loose; common fine and few medium roots; very strongly acid; gradual wavy boundary.
Cg3—50 to 80 inches; white (10YR 8/1) fine sand; single grained; loose; strongly acid.

Reaction ranges from extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 3 to 20 inches in thickness.

The Cg horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 4 to 8 and chroma of 0 to 2. In some pedons it has few or common mottles in shades of brown, yellow, or gray. The texture is fine sand or loamy fine sand. Most pedons have thin strata of material ranging from fine sand to fine sandy loam or sandy loam. The content of silt and clay at a depth of 10 to 40 inches ranges from 5 to 15 percent.

Ousley Series

The Ousley series consists of nearly level and gently sloping, somewhat poorly drained soils that formed in sandy fluvial deposits. These soils are on low terraces adjacent to flood plains. They are thermic, uncoated Aquic Quartzipsamments.

Ousley soils are associated with Mulat, Osier, and Surrency soils. Mulat, Osier, and Surrency soils are on flood plains and are frequently flooded.

Typical pedon of Ousley fine sand, 2 to 5 percent slopes, occasionally flooded, in a wooded area approximately 2.0 miles northeast of Florida Highway 125, 7.5 miles north-northwest of Macclenny, 750 feet north and 625 feet west of the southeast corner of sec. 27, T. 1 S., R. 21 E.

A1—0 to 5 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; many fine and common medium roots; very strongly acid; abrupt wavy boundary.
A2—5 to 10 inches; gray (10YR 5/1) fine sand; single grained; loose; common fine and few medium roots; very strongly acid; gradual wavy boundary.
C1—10 to 25 inches; light gray (10YR 7/2) fine sand; few fine distinct grayish brown (10YR 5/2) mottles; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.
C2—25 to 45 inches; white (10YR 8/2) fine sand; many coarse distinct light brownish gray (10YR 6/2) and common medium prominent dark yellowish brown (10YR 4/6) mottles; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.
Cg1—45 to 50 inches; dark brown (10YR 3/2) fine sand; few medium faint dark yellowish brown (10YR 4/4) streaks; single grained; loose; very strongly acid; gradual wavy boundary.
Cg2—50 to 75 inches; light gray (10YR 7/2) fine sand; many coarse distinct brown (10YR 5/3) and common fine and medium prominent yellowish brown (10YR 5/6) mottles; single grained; loose; very strongly acid; gradual wavy boundary.
Cg3—75 to 80 inches; white (10YR 8/1) fine sand; many coarse faint light gray (10YR 7/2) and common fine prominent yellowish brown (10YR 5/6) mottles; single grained; loose; very strongly acid.

The soils are sand or fine sand to a depth of 80 inches or more. Reaction is very strongly acid or strongly acid. The content of silt and clay at a depth of 10 to 40 inches ranges from 2 to 5 percent.

The A horizon has hue of 10YR, value of 3 to 7, and chroma of 1 or 2. If value is 3.5 or less, the horizon is less than 10 inches thick. The thickness of the A horizon ranges from 3 to 12 inches.

The C horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 3 to 8 and chroma of 0 to 4. It has few to many gray, brown, or yellow mottles. Mottles that have chroma of 0 to 2, which are indicative of wetness, are within a depth of 40 inches. Small pockets and thin strata of sand grains covered by organic matter are common.

Pamlico Series

The Pamlico series consists of nearly level, very poorly drained, organic soils that formed in highly decomposed organic material underlain by loamy marine and fluvial sediments. These soils are in depressions. They are sandy or sandy-skeletal, siliceous, dysic, thermic Terric Medisaprists.

Pamlico soils are associated with Dorovan, Leon, Olustee, Pelham, Plummer, and Surrency soils. Leon, Olustee, Pelham, and Plummer soils are in the higher positions on the landscape. Dorovan and Surrency soils are in positions on the landscape similar to those of the Pamlico soils. Dorovan soils have more than 52 inches of organic material. Surrency soils are mineral soils.

Typical pedon of Pamlico muck, in an area of Pantego-Pamlico, loamy substratum, complex, depressional; in a wooded area approximately 4.0 miles west of Macclenny; 0.5 mile north of U.S. Highway 90; 2,600 feet west and 1,750 feet north of the southeast corner of sec. 34, T. 1 S., R. 21 E.

Oa—0 to 18 inches; muck, black (10YR 2/1) broken face and rubbed; about 10 percent fiber, 5 percent rubbed; weak fine granular structure; very friable; common fine and medium and few coarse roots; about 5 percent mineral material; extremely acid; gradual wavy boundary.

C—18 to 22 inches; black (10YR 2/1) mucky fine sand; massive; very friable; common medium and few fine and coarse roots; extremely acid; gradual wavy boundary.

2Cg1—22 to 30 inches; grayish brown (10YR 5/2) fine sand; common medium faint light brownish gray (10YR 6/2) mottles; single grained; loose; few fine and medium roots; very strongly acid; clear wavy boundary.

2Cg2—30 to 42 inches; dark gray (10YR 4/1) loamy fine sand; single grained; loose; very strongly acid; clear wavy boundary.

2Cg3—42 to 55 inches; dark gray (10YR 4/1) sandy clay loam; massive; firm; very strongly acid; clear wavy boundary.

2Cg4—55 to 70 inches; dark grayish brown (10YR 4/2) loamy fine sand; single grained; loose; very strongly acid.

The Oa horizon is extremely acid (less than pH 4.5 in 0.01 molar calcium chloride). The underlying material is extremely acid to strongly acid.

The Oa horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2, or it is neutral in hue and has value of 2. The content of fiber is 10 to 30 percent unrubbed and less than 16 percent rubbed. This horizon ranges from 16 to 51 inches in thickness.

The C horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is fine sand, loamy fine sand, fine sandy loam, or sandy clay loam. The texture is fine sandy loam and sandy clay loam at a depth of more than 40 inches.

Pantego Series

The Pantego series consists of nearly level, very poorly drained soils that formed in sandy and loamy marine deposits. These soils are in depressions in the flatwoods. They are fine-loamy, siliceous, thermic Umbric Paleaquults.

Pantego soils are associated with Dorovan, Mascotte, Olustee, Pamlico, Pelham, Plummer, Rains, and Sapelo soils. Mascotte, Olustee, Pelham, Plummer, Rains, and Sapelo soils are in the higher positions on the landscape. Dorovan and Pamlico soils are in positions on the landscape similar to those of the Pantego soils. They are very poorly drained, are organic, and are on flood plains and in depressions.

Typical pedon of Pantego muck, in an area of Pantego-Pamlico, loamy substratum, complex, depressional; in a wooded area approximately 2.0 miles south of Macclenny and 0.1 mile west of Florida Highway 121; 1,700 feet west and 1,800 feet south of the northeast corner of sec. 18, T. 3 S., R. 22 E.

Oa—0 to 5 inches; black (10YR 2/1) muck; moderate medium granular structure; very friable; many fine, medium, and coarse roots; very strongly acid; clear wavy boundary.

A1—5 to 8 inches; black (10YR 2/1) mucky fine sandy loam; moderate medium granular structure; very friable; many fine, medium, and coarse roots; very strongly acid; clear wavy boundary.

A2—8 to 21 inches; black (10YR 2/1) fine sandy loam; weak medium granular structure; very friable; many fine and common medium roots; very strongly acid; gradual wavy boundary.

A3—21 to 26 inches; very dark gray (10YR 3/1) fine sandy loam; many coarse distinct dark grayish brown (10YR 3/1) streaks; weak fine granular structure; very friable; few fine roots; very strongly acid; abrupt wavy boundary.

Btg1—26 to 40 inches; light brownish gray (2.5YR 6/2) sandy clay loam; common medium prominent brownish yellow (10YR 6/8) mottles; few fine prominent very dark gray (10YR 3/1) streaks along root channels; weak coarse subangular blocky structure; friable; sand grains bridged and coated with clay; very strongly acid; gradual wavy boundary.

Btg2—40 to 80 inches; light brownish gray (2.5Y 6/2) sandy clay loam; weak very coarse subangular blocky structure; friable; sand grains bridged and coated with clay; very strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid throughout the profile.

Most pedons have an Oa horizon. This horizon blends into the mass of roots in the upper few inches of the A horizon. It has hue of 10YR, value of 2 or 3, and chroma of 1, or it is neutral in hue and has value of 2. It is less than 8 inches thick.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It ranges from loamy fine sand to fine sandy loam, or it is the mucky analogs of the textures within that range. It ranges from 4 to 18 inches in thickness.

The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is less than 16 inches thick.

The Btg horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 4 or 5 and chroma of 0 to 2. It has common or many mottles in shades of yellow, brown, and gray. The texture is sandy clay loam or fine sandy loam. This horizon ranges from 24 to 50 inches in thickness.

The C horizon, if it occurs, has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. The texture is fine sandy loam, loamy fine sand, or fine sand.

Pelham Series

The Pelham series consists of nearly level, poorly drained soils that formed in sandy and loamy marine deposits. These soils are on broad, low flats in the flatwoods. They are loamy, siliceous, thermic Arenic Paleaquults.

Pelham soils are associated with the moderately wet Blanton soils and Albany, Duplin, Leefield, Mulat, Ocilla, Olustee, Mascotte, Pamlico, Plummer, Rains, Sapelo, and Surrency soils. Blanton, Albany, Duplin, Leefield, Ocilla, Olustee, Mascotte, and Sapelo soils are in the higher positions on the landscape. Duplin soils are near drainageways. Mulat, Pamlico, and Surrency soils are in the lower positions on the landscape. Plummer and Rains soils are in positions on the landscape similar to those of the Pelham soils. Plummer soils have an argillic horizon at a depth of more than 40 inches. Rains soils have an argillic horizon within a depth of 20 inches.

Typical pedon of Pelham fine sand, in a wooded area approximately 9.5 miles southwest of Macclenny, 2.2 miles east of Florida Highway 229, 950 feet west and 1,900 feet north of the southeast corner of sec. 5, T. 4 S., R. 21 E.

A—0 to 6 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; many fine and few medium roots; very strongly acid; abrupt smooth boundary.

Eg—6 to 26 inches; light brownish gray (10YR 6/2) fine sand; common fine faint light gray (10YR 7/2) and common medium faint grayish brown (10YR 5/2) mottles; single grained; loose; few fine roots; few crayfish burrows; very strongly acid; gradual wavy boundary.

Btg1—26 to 33 inches; gray (10YR 6/1) fine sandy loam; common medium distinct yellowish brown (10YR 5/8) and common fine prominent strong brown (7.5YR 5/8) mottles; weak coarse subangular blocky structure; friable; few fine roots; sand grains bridged and coated with clay; very strongly acid; clear wavy boundary.

Btg2—33 to 42 inches; gray (10YR 6/1) fine sandy loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; firm; very strongly acid; clear wavy boundary.

Btg3—42 to 80 inches; gray (10YR 6/1) sandy clay loam; common medium prominent strong brown (7.5YR 5/6) and few fine prominent red (2.5YR 4/6) mottles; weak coarse subangular blocky structure; firm; very strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid throughout the profile, except in areas that have been limed. Depth to the underlying argillic horizon ranges from 20 to 40 inches.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It ranges from 4 to 9 inches in thickness.

The Eg horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 2. It is fine sand or loamy fine sand. It ranges from 18 to 32 inches in thickness.

The Btg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 5 to 7 and chroma of 0 to 2. It is generally fine sandy loam or sandy clay loam, but the range includes sandy clay in the lower part. The content of clay ranges from 15 to 30 percent in the upper 20 inches.

Penney Series

The Penney series consists of sloping, excessively drained soils that formed in thick deposits of marine sands. These soils are on upland side slopes. They are thermic, uncoated Typic Quartzipsamments.

Penney soils are associated with Albany, Blanton, Bonneau, Duplin, Ocilla, Ortega, Ridgewood, and Troup soils. These associated soils are in the lower positions on the landscape. Bonneau and Troup soils are on side slopes.

Typical pedon of Penney fine sand, in an area of Troup-Bonneau-Penney complex, 5 to 8 percent slopes; in a wooded area approximately 3.0 miles north-northwest of Macclenny; 0.9 mile west of Florida Highway 121; 1,400 feet west and 2,750 feet north of the southeast corner of sec. 18, T. 2 S., R. 22 E.

A—0 to 2 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; many fine and common medium roots; many uncoated sand grains; very strongly acid; clear smooth boundary.
E1—2 to 7 inches; yellowish brown (10YR 5/4) fine sand; single grained; loose; few fine roots; many uncoated sand grains; strongly acid; clear wavy boundary.
E2—7 to 35 inches; light yellowish brown (10YR 6/4) fine sand; few fine faint pale brown uncoated sand grains; few fine prominent black (10YR 2/1) charcoal fragments; single grained; loose; few fine roots; strongly acid; diffuse irregular boundary.
E3—35 to 50 inches; light yellowish brown (10YR 6/4) fine sand; few medium faint light gray (10YR 7/2) uncoated sand grains; few fine black (10YR 2/1) charcoal fragments; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.
E&B1—50 to 65 inches; pale brown (10YR 6/3) fine sand (E); strong brown (7.5YR 5/8) lamellae of loamy fine sand (B) 1/16 to 1/8 inch thick with sand grains coated with clay; few medium faint light gray (10YR 7/2) uncoated sand grains; single grained; loose; strongly acid; gradual wavy boundary.
E&B2—65 to 80 inches; light yellowish brown (10YR 6/4) fine sand (E); strong brown (7.5YR 5/6) lamellae of loamy fine sand (B) 1/8 to 1/4 inch thick with sand grains coated with clay; single grained; loose; common medium distinct light gray (10YR 7/2) uncoated sand grains; strongly acid.

The solum is more than 80 inches thick. The content of silt and clay is less than 5 percent at a depth of 10 to 40 inches. Thin lamellae, 1/16 to 1/4 inch thick, begin at a depth of 50 to 80 inches. Reaction ranges from very strongly acid to moderately acid. The texture is fine sand throughout the profile, except for the lamellae, which range to fine sandy loam.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. It ranges from 2 to 7 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 8. It has low-chroma mottles and streaks, but the color is that of the uncoated sand grains and is not indicative of wetness. The E horizon ranges from 42 to 72 inches in thickness.

The E part of the E&B horizon has hue of 10YR, value of 6 to 8, and chroma of 3 to 8. It contains small pockets of light gray and white sand grains. It is 2 to 6 inches thick between the lamellae. The B part of this horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 to 8. The lamellae range from 1/2 to 1/4 inch in thickness. They range from 1.2 to more than 24 inches in length. They generally increase in thickness with increasing depth.

Plummer Series

The Plummer series consists of nearly level, poorly drained soils that formed in sandy and loamy marine deposits. These soils are on broad, low flats in the flatwoods. They are loamy, siliceous, thermic Grossarenic Paleaquults.

Plummer soils are associated with the moderately wet Blanton soils and Albany, Surrency, Mulat, Pamlico, Pelham, Mascotte, Ocilla, and Sapelo soils. The moderately wet Blanton soils and Albany, Mascotte, Ocilla, and Sapelo soils are in the higher positions on the landscape. Surrency, Mulat, and Pamlico soils are in the lower positions on the landscape. Pelham soils are in positions on the landscape similar to those of the Plummer soils. They have an argillic horizon at a depth of 20 to 40 inches.

Typical pedon of Plummer fine sand, in a wooded area approximately 8.0 miles northwest of Macclenny, 0.9 mile southeast of Florida Highway 125, 2,500 feet north and 3,000 feet west of the southeast corner of sec. 5, T. 2 S., R. 21 E.

A—0 to 4 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; many fine and common medium roots; extremely acid; clear smooth boundary.
Eg1—4 to 18 inches; grayish brown (10YR 5/2) fine sand; common medium distinct very dark gray (10YR 3/1) streaks; single grained; loose; common fine roots; very strongly acid; gradual wavy boundary.
Eg2—18 to 45 inches; light gray (10YR 7/1) fine sand; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.
Btg—45 to 80 inches; light brownish gray (10YR 6/2) sandy clay loam; many coarse prominent strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; firm; few fine roots; sand grains bridged and coated with clay; strongly acid.

The solum is more than 72 inches thick. Reaction is very strongly acid or strongly acid throughout the profile, except in areas that have been limed. Depth to the underlying argillic horizon ranges from 40 to 80 inches.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1. It ranges from 4 to 12 inches in thickness. If this horizon is very dark gray or black, it is less than 8 inches thick.

The Eg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of red, gray, yellow, and brown. It ranges from 36 to 70 inches in thickness.

The Btg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 5 or 6 and chroma of 0 to 2. It has mottles in shades of brown, yellow, and red. It generally is fine sandy loam or sandy clay loam, but some pedons have pockets of loamy fine sand and sandy clay. The content of clay ranges from 15 to 35 percent.

Pottsburg Series

The Pottsburg series consists of nearly level, poorly drained and somewhat poorly drained soils that formed in sandy marine deposits. These soils are in the flatwoods and on narrow to broad ridges and isolated knolls in the flatwoods. They are sandy, siliceous, thermic Grossarenic Haplaquods.

Pottsburg soils are associated with Allanton, Boulogne, Surrency, Evergreen, Hurricane, Kingsferry, Leon, Mandarin, and Ridgewood soils. Hurricane, Mandarin, and Ridgewood soils are in the higher positions on the landscape. Allanton, Surrency, Evergreen, and Kingsferry soils are in the lower positions on the landscape. Boulogne soils are in positions on the landscape similar to those of the Pottsburg soils. They have a spodic horizon within a depth of 30 inches. Leon soils are in landscape positions similar to or lower than those of the Pottsburg soils.

Typical pedon of Pottsburg sand (fig. 18), in a wooded area approximately 5.5 miles east-northeast of Macclenny, 3.0 miles north of U.S. Highway 90, 1,350 feet north and 2,850 feet east of the southwest corner of sec. 12, T. 2 S., R. 22 E.

Ap—0 to 4 inches; black (10YR 2/1) sand; moderate medium granular structure; very friable; many fine, medium, and coarse roots; very strongly acid; clear smooth boundary.

A—4 to 8 inches; very dark gray (10YR 3/1) sand; weak medium granular structure; very friable; common fine and common medium roots; extremely acid; gradual wavy boundary.

E1—8 to 36 inches; dark gray (10YR 4/1) sand; weak fine granular structure; very friable; few medium roots; strongly acid; clear wavy boundary.

E2—36 to 46 inches; light brownish gray (10YR 6/2) sand; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

EB—46 to 53 inches; brown (7.5YR 5/2) sand; single grained; loose; extremely acid; clear wavy boundary.

Bh—53 to 80 inches; black (5YR 2/1) sand; massive; friable; sand grains coated with organic matter; very strongly acid.

The solum is more than 80 inches thick. Depth to the spodic horizon ranges from 51 to 79 inches. The profile is sand or fine sand throughout, except in the Bh horizon, which includes loamy sand or loamy fine sand. Reaction ranges from extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. It ranges from 3 to 8 inches in thickness.

The E horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 to 4 in the upper part and hue of 7.5YR or 10YR, value of 4 to 8, and chroma of 1 or 2 in the lower part. It ranges from 30 to 70 inches in thickness.

The Bh horizon has hue of 10YR to 5YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. Sand grains are well coated with organic matter.

Rains Series

The Rains series consists of nearly level, poorly drained soils that formed in sandy and loamy marine deposits. These soils are on broad, low flats in the flatwoods. They are fine-loamy, siliceous, thermic Typic Paleaquults.

Rains soils are associated with Duplin, Surrency, Mulat, Ocilla, Mascotte, Olustee, and Pelham soils. Duplin, Ocilla, Mascotte, and Olustee soils are in the higher positions on the landscape. Duplin soils are near drainageways. Surrency and Mulat soils are in the lower positions on the landscape. Pelham soils are in positions on the landscape similar to those of the Rains soils. Pelham soils have an argillic horizon at a depth of 20 to 40 inches.

Typical pedon of Rains loamy fine sand, in a wooded area approximately 2.75 miles southwest of Macclenny, 2.1 miles east of Florida Highway 121, 150 feet west and 2,500 feet north of the southeast corner of sec. 22, T. 3 S., R. 21 E.

A—0 to 8 inches; very dark gray (10YR 3/1) loamy fine sand; moderate medium granular structure; very friable; many fine and common medium roots; very strongly acid; clear smooth boundary.

Eg—8 to 15 inches; grayish brown (10YR 5/2) loamy fine sand; many medium prominent strong brown (7.5YR 4/6) and many medium distinct yellowish brown (10YR 5/4) mottles; single grained; loose; common fine roots; very strongly acid; abrupt wavy boundary.

Btg1—15 to 20 inches; light brownish gray (10YR 6/2) fine sandy loam; many coarse distinct light yellowish brown (10YR 6/4) mottles; weak coarse subangular blocky structure; friable; few fine roots; sand grains bridged and coated with clay; very strongly acid; gradual wavy boundary.

Btg2—20 to 60 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium prominent yellowish brown (10YR 5/6) and red (2.5YR 4/8) mottles; weak coarse subangular blocky structure; friable; few fine roots; sand grains bridged and coated with clay; very strongly acid.

The solum is more than 60 inches thick. Reaction is very strongly acid or strongly acid throughout the profile, except in areas that have been limed. Depth to the argillic horizon ranges from 20 to 40 inches.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It ranges from 4 to 10 inches in thickness.

The Eg horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. It ranges from 3 to 11 inches in thickness.

The Btg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 2. It has few to many brown, yellow, or red mottles throughout. It is fine sandy loam or sandy clay loam. The content of silt is less than 30 percent in the upper 20 inches. In some pedons the lower part is sandy clay.

The Cg or 2Cg horizon, if it occurs, has hue of 10YR or is neutral in hue. It has value of 5 to 7 and chroma of 0 to 2. Some pedons have mottles with higher chroma. The texture ranges from sand to sandy clay, or the horizon is stratified. This horizon extends to a depth of 80 inches or more.

Ridgewood Series

The Ridgewood series consists of nearly level and gently sloping, somewhat poorly drained soils that formed in sandy marine deposits. These soils are on narrow to broad ridges and isolated knolls in the flatwoods. They are thermic, uncoated Aquic Quartzipsamments.

Ridgewood soils are associated with Boulogne, Hurricane, Leon, Mandarin, Ortega, Pottsburg, and Pottsburg, high, soils. Ortega soils are moderately well drained and are on narrow, broad ridges and isolated knolls in the uplands. Hurricane and Pottsburg, high, soils have a spodic horizon at a depth of more than 50 inches. They are in positions on the landscape similar to those of the Ridgewood soils. Mandarin soils are somewhat poorly drained and are on narrow to broad ridges and isolated knolls that are slightly higher on the landscape than the adjacent flatwoods. Boulogne, Leon, and Pottsburg soils are poorly drained and are in the flatwoods.

Typical pedon of Ridgewood fine sand (fig. 19), in an area of Hurricane and Ridgewood soils, 0 to 5 percent slopes; in a wooded area approximately 3.75 miles east of Macclenny; 0.9 mile north of U.S. Highway 90; 2,000 feet north and 200 feet west of the southeast corner of sec. 23, T. 2 S., R. 22 E.

Ap—0 to 4 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; many fine, common medium, and few coarse roots; very strongly acid; abrupt smooth boundary.

C1—4 to 12 inches; brown (10YR 5/3) fine sand; common medium distinct dark grayish brown (10YR 4/2) and common medium faint light yellowish brown (10YR 6/4) mottles; few fine distinct black (10YR 2/1) charcoal specks; single grained; loose; many fine and common medium and coarse roots; very strongly acid; clear wavy boundary.

C2—12 to 24 inches; olive yellow (2.5Y 6/6) fine sand; few fine distinct pale yellow (10YR 6/3) mottles; few fine prominent black (10YR 2/1) charcoal specks; single grained; loose; common fine, many medium, and few coarse roots; very strongly acid; gradual wavy boundary.

C3—24 to 35 inches; olive yellow (2.5Y 6/6) fine sand; common medium distinct very pale brown (10YR 7/3) and few fine prominent strong brown (7.5YR 5/8) mottles; few fine prominent black (10YR 2/1) charcoal specks; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

C4—35 to 45 inches; pale yellow (2.5Y 7/4) fine sand; many medium distinct light gray (10YR 7/2) and few medium prominent strong brown (7.5YR 5/8) mottles; few fine prominent black (10YR 2/1) charcoal specks; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

Cg1—45 to 60 inches; light gray (10YR 7/2) fine sand; many medium prominent strong brown (7.5YR 5/8) and common medium distinct pale yellow (2.5Y 7/4) mottles; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

Cg2—60 to 76 inches; light gray (10YR 7/2) fine sand; many coarse prominent yellowish red (5YR 5/8) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

Cg3—76 to 80 inches; light gray (10YR 7/2) fine sand; single grained; loose; very strongly acid.

The texture is sand or fine sand. The content of silt and clay is less than 5 percent between depths of 10 and 40 inches. Reaction ranges from very strongly acid to moderately acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 4 to 6 inches in thickness.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. Few or common mottles in shades of gray, brown, yellow, and red, which are generally indicative of wetness, are at a depth of 18 to 42 inches. The C horizon ranges from 6 to 46 inches in thickness.

The Cg horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 or 2. In some pedons it has mottles.

Sapelo Series

The Sapelo series consists of nearly level, poorly drained soils that formed in loamy and sandy marine deposits. These soils are in the flatwoods. They are sandy, siliceous, thermic Ultic Haplaquods.

Sapelo soils are associated with Albany, Allanton, Boulogne, Surrency, Kingsferry, Leon, Mascotte, Mulat, Ocilla, Olustee, Pelham, and Plummer soils. Albany and Ocilla soils are in the higher positions on the landscape. Allanton, Surrency, Kingsferry, Mulat, Pelham, and Plummer soils are in the lower positions on the landscape. Boulogne, Leon, Mascotte, and Olustee soils are in positions on the landscape similar to those of the Sapelo soils. Boulogne and Leon soils do not have an argillic horizon, and Mascotte and Olustee soils have an argillic horizon within a depth of 40 inches.

Typical pedon of Sapelo fine sand (fig. 20), in a wooded area approximately 8.75 miles northwest of Macclenny, 0.7 mile west of County Road 127, 800 feet west and 1,300 feet north of the southeast corner of sec. 1, T. 2 S., R. 21 E.

A—0 to 6 inches; very dark gray (10YR 3/1) fine sand; moderate medium granular structure; very friable; many fine, medium, and coarse roots; very strongly acid; clear smooth boundary.

E—6 to 18 inches; light gray (10YR 7/1) fine sand; single grained; loose; common fine and many medium and coarse roots; strongly acid; clear smooth boundary.

Bh1—18 to 22 inches; black (5YR 2/1) fine sand; massive; friable; common fine and few medium roots; sand grains coated with organic matter; extremely acid; clear wavy boundary.

Bh2—22 to 26 inches; dark reddish brown (5YR 3/3) fine sand; massive; firm; about 40 percent of the horizon is weakly cemented; few fine and medium roots; sand grains well coated with organic matter; very strongly acid; clear wavy boundary.

BE—26 to 31 inches; yellowish brown (10YR 5/4) fine sand; common fine prominent dark reddish brown (5YR 3/3) mottles; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

E′—31 to 48 inches; light gray (10YR 7/2) fine sand; common fine prominent dark reddish brown (5YR 3/3) and few fine prominent strong brown (7.5YR 5/8) mottles; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

Btg1—48 to 55 inches; light gray (2.5YR 7/2) sandy clay loam; common medium prominent brownish yellow (10YR 6/6) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; sand grains bridged and coated with clay; very strongly acid; gradual wavy boundary.

Btg2—55 to 70 inches; light gray (10YR 7/1) sandy clay loam; common medium prominent strong brown (7.5YR 5/8) and few medium prominent red (2.5YR 4/6) mottles; weak very coarse subangular blocky structure; friable; sand grains bridged and coated with clay; strongly acid; gradual wavy boundary.

Cg—70 to 80 inches; light gray (10YR 7/1) fine sandy loam; few medium prominent light yellowish brown (10YR 6/4) mottles; massive; firm; very strongly acid.

The solum ranges from 70 to more than 80 inches in thickness. Reaction is very strongly acid or strongly acid throughout the profile, except in areas that have been limed. Depth to the Bh horizon ranges from 10 to 30 inches, and depth to the Btg horizon ranges from 40 to 70 inches.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It ranges from 3 to 8 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It ranges from 7 to 22 inches in thickness.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 4, or it is neutral in hue and has value of 2. It is fine sand or loamy fine sand. In some pedons, 15 to 40 percent of the Bh horizon is weakly cemented. The horizon ranges from 5 to 24 inches in thickness.

The BE horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. It is less than 15 inches thick.

The E′ horizon, if it occurs, has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of red, yellow, and brown. In some pedons it has few or common fine to coarse, weakly cemented fragments of ortstein. The E′ horizon is less than 31 inches thick.

The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of yellow, red, and brown. It generally is fine sandy loam or sandy clay loam, but some pedons have pockets of sand and sandy clay. In some pedons this horizon extends to a depth of 80 inches or more.

Surrency Series

The Surrency series consists of nearly level, very poorly drained soils that formed in sandy and loamy marine deposits. These soils are on flood plains. They are loamy, siliceous, thermic Arenic Umbric Paleaquults.

Surrency soils are associated with Mascotte, Mulat, Olustee, Osier, Ousley, Pelham, Plummer, Pottsburg, Rains, and Sapelo soils. Mascotte, Olustee, Ousley, Pelham, Plummer, Pottsburg, Rains, and Sapelo soils are in the higher positions on the landscape. Mulat soils are in positions on the landscape similar to those of the Surrency soils. Mulat soils are sandy within a depth of 60 inches.

Typical pedon of Surrency mucky fine sand, in an area of Surrency-Mulat complex, frequently flooded; in a wooded area approximately 6.5 miles north-northwest of Macclenny; 2.5 miles west of Florida Highway 121; 2,225 feet east and 1,000 feet north of the southwest corner of sec. 35, T. 1 S., R. 21 E.

A1—0 to 8 inches; black (10YR 2/1) mucky fine sand; moderate medium granular structure; very friable; many fine, medium, and coarse roots; very strongly acid; clear wavy boundary.

A2—8 to 21 inches; black (10YR 2/1) fine sand; weak medium granular structure; very friable; many fine and common medium roots; very strongly acid; gradual wavy boundary.

A3—21 to 28 inches; very dark gray (10YR 3/1) fine sand; many coarse distinct dark grayish brown (10YR 3/1) streaks; weak fine granular structure; very friable; few fine roots; very strongly acid; abrupt wavy boundary.

Btg1—28 to 48 inches; light brownish gray (2.5Y 6/2) sandy clay loam; common medium prominent brownish yellow (10YR 6/8) mottles; few fine prominent very dark gray (10YR 3/1) streaks along root channels; weak coarse subangular blocky structure; friable; sand grains bridged and coated with clay; very strongly acid; gradual wavy boundary.

Btg2—48 to 80 inches; light brownish gray (10YR 5/1) sandy clay loam; weak very coarse subangular blocky structure; friable; sand grains bridged and coated with clay; very strongly acid.

The solum ranges from 70 to more than 80 inches in thickness. Reaction is strongly acid or very strongly acid throughout the profile.

Some pedons have an Oa horizon. This horizon blends into a mass of roots in the upper few inches of the A horizon. It has hue of 10YR, value of 2 or 3, and chroma of 1, or it is neutral in hue and has value of 2. It is less than 8 inches thick.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It ranges from fine sand to fine sandy loam, or it is the mucky analogs of the textures within that range. It ranges from 10 to 22 inches in thickness.

The Eg horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is less than 29 inches thick.

The Btg horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 4 or 5 and chroma of 0 to 2. It has common or many mottles in shades of yellow, brown, and gray. It generally is sandy clay loam, but in some pedons the upper 5 to 10 inches is fine sandy loam. The content of clay in the upper 20 inches ranges from 10 to 18 percent. The Btg horizon ranges from 24 to 50 inches in thickness.

The C horizon, if it occurs, has hue of 10YR, 2.5Y, or 5Y or is neutral in hue and has value of 4 to 6 and chroma of 0 to 2, or it has hue of 5Y, value of 4 to 6, and chroma of 1. It is fine sandy loam, loamy fine sand, or fine sand.

Troup Series

The Troup series consists of sloping, well drained soils that formed in thick deposits of sandy and loamy marine material. These soils are on upland side slopes. They are loamy, siliceous, thermic Grossarenic Kandiudults.

Troup soils are associated with Blanton, Bonneau, Duplin, Ocilla, Ortega, Penney, and Ridgewood soils. Blanton, Duplin, Ocilla, Ortega, and Ridgewood soils are in the lower positions on the landscape. Bonneau and Penney soils are in positions on the landscape similar to those of the Troup soils. Bonneau soils have an argillic horizon at a depth of 20 to 40 inches. The excessively drained Penney soils have lamellae.

Typical pedon of Troup fine sand (fig. 21), in an area of Troup-Bonneau-Penney complex, 5 to 8 percent slopes; in a wooded area approximately 4.75 miles northwest of Macclenny and 150 feet west of Florida Highway 121; 1,650 feet east and 3,600 feet south of the northwest corner of sec. 5, T. 2 S., R. 22 E.

A—0 to 8 inches; grayish brown (10YR 5/2) fine sand; weak medium granular structure; very friable; many fine roots; very strongly acid; clear wavy boundary.

E1—8 to 17 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; common fine roots; very strongly acid; clear wavy boundary.

E2—17 to 31 inches; light yellowish brown (10YR 6/4) fine sand; common medium distinct light gray (10YR 7/2) uncoated sand grains; few fine prominent strong brown mottles; single grained; strong brown (7.5YR 5/6) streaks that are 1 to 2 millimeters thick; loose; few fine roots; strongly acid; clear smooth boundary.

E3—31 to 49 inches; light yellowish brown (10YR 6/4) fine sand; common medium distinct light gray (10YR 7/2) uncoated sand grains; few medium prominent strong brown (7.5YR 5/6) lamellae that are 1 to 5 millimeters thick; single grained; loose; few fine roots; moderately acid; gradual wavy boundary.

Bt1—49 to 55 inches; light yellowish brown (10YR 6/4) fine sandy loam; few strong brown (7.5YR 5/8) mottles; weak coarse subangular blocky structure; very friable; few fine roots; strongly acid; clear wavy boundary.

Bt2—55 to 74 inches; strong brown (7.5YR 5/6) sandy clay loam; few medium dominant yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; friable; sand grains bridged and coated with clay; less than 5 percent ironstone nodules; few fine roots; very strongly acid; clear wavy boundary.

Bt3—74 to 80 inches; red (2.5YR 4/8) fine sandy loam; weak coarse subangular blocky structure; firm; sand grains bridged and coated with clay; few fine roots; very strongly acid.

The solum is more than 80 inches thick. Reaction ranges from very strongly acid to moderately acid in the surface layer and subsurface layer, except in areas that have been limed. It is very strongly acid or strongly acid in the subsoil. The A and E horizons range from 40 to 79 inches in thickness. The content of quartz gravel and ironstone nodules, by volume, is as much as 10 percent in the solum.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 2 to 4. It ranges from 4 to 9 inches in thickness.

The E horizon has hue of 2.5Y or 10YR, value of 5 to 8, and chroma of 3 to 6. In most pedons it has few or common uncoated sand grains. It ranges from 31 to 75 inches in thickness.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 to 7, and chroma of 4 to 8. It is fine sandy loam or sandy clay loam. The content of plinthite, by volume, is less than 5 percent within a depth of 60 inches. The Bt horizon ranges from 6 to more than 20 inches in thickness.

Formation of the Soils

In this section, the factors of soil formation are related to the soils in Baker County. In addition, the processes of horizon differentiation are described.

Factors of Soil Formation

Soil forms through weathering and other processes that act on deposited or accumulated geologic material. The kind of soil that forms depends on the physical and mineral composition of the parent material; the climate under which soil material has accumulated and has existed since accumulation; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time that these factors have acted on the soil material *(12)*. All of these factors affect the formation of each soil, but the relative importance of each factor differs from place to place. In some areas one factor may dominate in the formation of a soil and determine most of the soil properties. For example, if the parent material consists of pure quartz sand, which is highly resistant to weathering, the soil generally has weakly expressed horizons. Even in quartz sand, however, a distinct profile can be formed under certain types of vegetation if the relief is low and flat and the water table is high.

The interrelationship among these five factors is complex, and the effects of any one factor cannot be isolated and completely evaluated. On the following pages, each factor is described separately and the probable effects of each are indicated.

Parent Material

The parent material of the soils in Baker County consists almost entirely of deposits of marine origin. These deposits are mostly quartz sand with varying amounts of clay and shell fragments. Clay is more abundant in soils that formed in the sediment on marine terraces and in lagoons. It is virtually absent on ancient shoreline ridges, where most deposits are eolian sands. The parent material was transported by ocean currents. The ocean covered the area a number of times during the Pleistocene age.

The parent materials in the county differ 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 the soils in the county reflect original differences in the parent material as it was laid down.

Some organic soils are throughout the county. These soils formed in partially decayed wetland vegetation.

Climate

Climate, particularly temperature and rainfall, largely determines the rate and nature of the physical, chemical, and biological processes that affect the weathering of soil material. Rainfall, changing temperatures, wind, and sun advance the breakdown of rocks and minerals, the release of chemicals, and other processes that affect the development of the soils. The amount of water that percolates through the soil depends on rainfall, relative humidity, permeability, and physiographic position. Temperature influences the kinds of organisms and their growth and the rate of physical and chemical reactions in the soils.

Baker County has a warm, humid climate characterized by long, hot summers and short, mild winters. The soils generally are low in bases because most of the rainfall percolates downward through the soil. Because the rainfall generally is well distributed, most of the soils are moist throughout the year. Climate throughout the survey area is uniform; therefore, it has had about the same effect on soil development in all parts of the county. Most of the soils are highly weathered, leached, strongly acid, and low in natural fertility and organic matter.

Plants and Animals

Plants, animals, and other organisms have a significant role in soil development. Plant and animal life can increase the content of organic matter and nitrogen, increase or decrease plant nutrients, and change the structure and porosity of the soils.

Plants recycle plant nutrients, accumulate organic matter, and provide food and cover for animal life. They stabilize the surface layer so that soil-forming processes can continue. Vegetation also provides a more stable environment for soil-forming processes by protecting the soils from extremes in temperature.

The soils in Baker County formed under a succession of plants. This succession is still evident in the hardwoods and cypress in the very poorly drained areas and the pine trees in the moderately well drained to poorly drained areas.

Animals rearrange soil materials by roughening the soil surface, forming and filling channels, and shaping the peds and voids. The soil is mixed by the channeling of ants, wasps, worms, and spiders and the burrowing of crustacea, such as crabs and crayfish, and of turtles and other reptiles. Bacteria, fungi, and other micro-organisms hasten the decomposition of organic matter and increase the release of minerals for additional plant growth. Humans affect the soil-forming process by tilling the soil for agriculture, removing natural vegetation and establishing other plants, and reducing or increasing the fertility of the soil.

The net gains and losses caused by plants and animals in the soil-forming process are important in this survey area. Plant residue provides most of the organic matter for the formation of the umbric epipedon in Kingsferry, Pantego, and Surrency soils.

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.

Even though the terrain of Baker County is mostly nearly level, relief has a significant effect on the soils. The soils are sandy because the parent material consists mostly of sandy marine deposits. Because sandy soils have a low available water capacity and easily become droughty, most of the water available to plants comes from the water table. As a result, depth to the water table is extremely important in determining the type of vegetation that grows in a particular area.

Depth to the water table also affects internal drainage. On the sand ridges, where the water table is deep and the soils are highly leached, soluble plant nutrients and colloidal clays and organic matter are carried rapidly downward through the sandy soil.

In the flatwoods the water table is commonly near the surface and is rarely 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 low areas or depressions, where the water table is generally 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 or only partially decays. The amount of muck that accumulates depends mainly 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, living organisms, and relief are slow. The length of time needed to convert raw geologic materials into soil varies according to the nature of the geologic material and the interaction of the other factors. Some basic minerals from which soils are formed weather fairly rapidly, while other minerals are chemically inert and show little change over long periods of time. The rate of translocation of fine particles in the soil to form horizons varies under different conditions, but the processes always take a relatively long time.

In Baker County the dominant geologic materials are inert. The sands are almost pure quartz and are highly resistant to weathering. The finer textured silts and clays are the products of earlier weathering.

Relatively little geologic time has elapsed since the material in which the soils in the survey area formed was laid down or emerged from the sea. The loamy and clayey horizons formed in place through processes of clay translocation.

Processes of Horizon Differentiation

Soil morphology refers to the process that involves the differentiation of soil horizons. The differentiation of horizons in the soils of Baker County is the result of accumulation of organic matter, leaching of carbonates, reduction and transfer of iron, or accumulation of silicate clay minerals. In the formation of most soils, more than one of these processes is involved.

Some organic matter has accumulated in the upper layers of most of the soils to form an A horizon. The content of organic matter is low in some of the soils and fairly high in others.

Carbonates and salts have been leached in most of the soils. Because the leaching permitted the subsequent translocation of silicate clay materials in some soils, the effects of leaching have been indirect. Most of the soils in the survey area are leached to varying degrees and have an E horizon.

The process of chemical reduction, or gleying, is evident in many of the soils in the county. This process is not evident, however, in the excessively drained soils. Gleying is caused by wetness. Gray matrix colors in the B horizon in many soils and grayish mottles in other soils indicate the reduction of iron. In some horizons, reddish brown mottles and concretions indicate the segregation of iron and a fluctuating water table.

The translocation of silicate clay, colloidal organic matter, and iron oxides has contributed to horizon development in many of the soils in the survey area. The movement of clay, organic matter, or iron in many of the soils is evident by a leached E horizon that is light colored, by a Bt or Bh horizon in which sand grains are bridged and coated with clay or colloidal organic matter, or by a few patchy clay films on faces of peds and in root channels.

References

(1) American Association of State Highway and Transportation Officials. 1986. Standard specifications for highway materials and methods of sampling and testing. Ed. 14, 2 vols.

(2) American Society for Testing and Materials. 1993. Standard classification of soils for engineering purposes. ASTM Stand. D 2487.

(3) Barber, Gene. (n.d.) An architectural guide to Baker County, Florida. Baker County Hist. Soc.

(4) Barnes, R.L. 1955. Growth and yield of slash pine plantations in Florida. Univ. of Florida Res. Rep. 3.

(5) Bond, P.A., K.M. Campbell, and T.M. Scott. 1986. An overview of peat in Florida. Florida Geol. Surv. Spec. Publ. 27.

(6) Broadfoot, Walter M. 1964. Soil suitability for hardwoods in the Midsouth. U.S. Dep. Agric., Forest Serv., South. Forest Exp. Stn. Res. Note SO-10.

(7) Brooks, H.K. 1981. Physiographic divisions of the State of Florida. Florida Coop. Ext. Serv., Inst. for Food and Agric. Sci., Univ. of Florida.

(8) Campbell, K.M. 1986. The industrial minerals of Florida. Florida Geol. Surv. Inf. Circ. 102.

(9) Ceryak, R., M.S. Knapp, and T. Burnson. 1983. The geology and water resources of the Upper Suwannee River Basin, Florida. Florida Geol. Surv. Rep. of Invest. 87.

(10) Doolittle, J.A. 1982. Characterizing soil map units with the ground-penetrating radar. Soil Sci. Soc. Am., Soil Surv. Horiz. 23 (No. 4): 3-10.

(11) Doolittle, J.A. 1983. Investigating Histosols with the ground-penetrating radar. Soil Sci. Soc. Am., Soil Surv. Horiz. 24 (No. 3): 23-28.

(12) Jenny, Hans. 1941. Factors of soil formation.

(13) Johnson, R.A. 1986. Shallow stratigraphic core tests. Florida Geol. Surv. Inf. Circ. 103.

(14) Johnson, R.W., R. Glaccum, and R. Wojtasinski. 1979. Application of ground-penetrating radar to soil survey. Proc. Soil and Crop Sci. Soc. of Florida 39: 68-72. (Reprinted in Soil Surv. Horiz. 23, Fall 1982)

(15) Knapp, M.S. 1978. Environmental geology series—Valdosta sheet. Florida Bur. of Geol. Map Ser. 88.

(16) Leve, G.W. 1986. Reconnaissance of the ground-water resources of Baker County, Florida. Florida Div. of Geol. Rep. of Invest. 52.

(17) Miller, J.A., H.H. Gilbert, R.W. Hull, J. Vecchioli, and P.R. Seaber. 1978. Impact of potential phosphate mining on the hydrology of Osceola National Forest, Florida. U.S. Geol. Surv., Water. Resour. Invest. 78-6.

(18) Pirkle, E.C., W.A. Pirkle, and W.H. Yoho. 1977. The highland heavy mineral sand deposits on Trail Ridge in northern peninsular Florida. Florida Bur. of Geol. Rep. of Invest. 84.

(19) Puri, H.S. 1957. Stratigraphy and zonation of the Ocala Group. Florida Geol. Surv. Bull. 38.

(20) Puri, H.S., and R.O. Vernon. 1964 (rev.). Summary of the geology of Florida and a guidebook to the classic exposures. Florida Geol. Surv. Spec. Publ. 5.

(21) Schumacher, F.X., and T.S. Coile. 1960. Growth and yield of natural stands of the southern pines.

(22) Scott, T.M. 1988. The lithostratigraphy of the Hawthorn Group (Miocene) of Florida. Florida Geol. Surv. Bull. 59.

(23) Shih, S.F., and J.A. Doolittle. 1984. Using radar to investigate organic soil thickness in the Florida Everglades. Soil Sci. Soc. Am. Jour. 48: 651-656.

(24) Southeastern Geological Society Ad Hoc Committee. 1986. Hydrogeological units of Florida. Florida Geol. Surv. Spec. Publ. 28.

(25) Spencer, S.M. 1989. The industrial minerals industry directory of Florida. Florida Geol. Surv. Inf. Circ. 105, pt. I.

(26) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436.

(27) United States Department of Agriculture. 1976. Volume, yield, and stand tables for second growth southern pines. Forest Serv. Misc. Publ. 50.

(28) United States Department of Agriculture. 1984 (rev.). Procedures for collecting soil samples and methods of analysis for soil survey. Soil Surv. Invest. Rep. 1.

(29) United States Department of Agriculture. 1985. Site index and yield of second growth baldcypress. Soil Conserv. Serv., Tech. Note 5.

(30) United States Department of Agriculture. 1985. Twenty-six ecological communities of Florida. Soil Conserv. Serv.

(31) United States Department of Agriculture. 1993. Soil survey manual. U.S. Dep. Agric. Handb. 18.

(32) United States Department of Commerce. 1972. Climate of the United States. Climate of Florida. Climatography of the United States, No. 60-8.

(33) United States Department of Commerce, Bureau of the Census. 1987. Census of agriculture, vol. 1, pt. 9.

(34) United States Department of Commerce, National Climatic Center. 1976. Climate of Lake City, Florida. No. 20.

(35) University of Florida. 1985. Florida statistical abstract. Bur. of Econ. and Bus. Res., Coll. of Bus. Admin.

(36) White, William A. 1970. The geomorphology of the Florida peninsula. Florida Dep. Nat. Resour., Bur. of Geol. Bull. 51.

Glossary

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

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

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

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

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.

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.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

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

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

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

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

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 textured soil. Sand or loamy sand.

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

Complex, soil. A map unit of two or more kinds of soil 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.

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.

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.

Depression. An area that is lower in elevation than the surrounding area and is ponded for several months or more during most years.

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 human or animal activities or of a catastrophe in nature, such as fire, that exposes the surface.

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

Fast intake (in tables). The rapid movement of water into the soil.

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

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, or clay.

Flatwoods. Broad, nearly level areas of poorly drained soils that support open pine forest and an understory of saw palmetto and gallberry.

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

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.

Ground water (geology). Water filling all the unblocked pores of the material below the water table.

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

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 uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

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 (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying 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, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock 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.

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 less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

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

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

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Knoll. A natural mound.

Landform. A discernible natural landscape, such as flatwoods, flood plains, depressions, or low ridges.

Landscape. All the natural features, such as fields, hills, forests, and water, that distinguish one part of the earth's surface from another part; generally, that portion of land or territory which the eye can comprehend in a single view, including all of its natural characteristics.

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.

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.

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 three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

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

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 affecting the specified use.

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

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 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). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

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.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Ridge. An area, generally long and narrow, that is higher in elevation than the surrounding landform.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

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. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

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 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.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

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.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period of 1951-74 at Lake City, Florida)

Month	Temperature					Precipitation				
	Normal monthly mean	Normal daily maximum	Normal daily minimum	Mean number of days with temperature of--		Normal total	Maximum total	Minimum total	Mean number of days with rainfall of--	
				90 °F or higher	32 °F or lower				0.10 inch or more	0.50 inch or more
	°F	°F	°F			In	In	In		
January----	54.5	66.4	42.5	0	7	3.57	9.18	0.33	6	2
February---	56.0	68.4	43.6	0	4	3.89	7.77	.76	6	3
March------	61.8	74.6	48.9	0	2	3.98	8.71	.76	6	3
April------	68.4	81.4	55.3	1	0	3.28	10.03	.95	5	2
May--------	74.5	87.3	61.6	10	0	4.30	11.45	.39	6	3
June-------	79.0	90.5	67.5	19	0	7.08	15.31	2.62	10	4
July-------	80.8	91.4	70.1	23	0	7.03	12.72	2.95	12	5
August-----	80.9	91.6	70.1	23	0	6.99	13.86	2.05	11	5
September--	78.1	88.5	67.7	14	0	5.83	12.34	.26	7	3
October----	70.0	81.5	58.4	2	0	2.55	9.68	.06	4	2
November---	61.1	73.5	48.7	0	2	2.24	6.90	.05	4	2
December---	55.6	67.8	43.4	0	6	3.44	10.24	.26	5	2
Year-----	68.4	80.2	56.5	92	21	54.18	---	---	82	36

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-74 at Lake City, Florida)

Probability	Temperature			
	32 °F or lower	28 °F or lower	24 °F or lower	20 °F or lower
Last freezing temperature in spring:				
1 year in 10 later than--	Mar. 29	Mar. 9	Feb. 18	Feb. 6
3 years in 10 later than--	Mar. 19	Feb. 22	Feb. 1	Jan. 11
5 years in 10 later than--	Mar. 11	Feb. 12	Jan. 20	*
7 years in 10 later than--	Mar. 4	Feb. 2	Jan. 5	*
9 years in 10 later than--	Feb. 21	Jan. 18	*	*
First freezing temperature in fall:				
1 year in 10 earlier than--	Nov. 5	Nov. 13	Dec. 1	Dec. 16
3 years in 10 earlier than--	Nov. 15	Nov. 27	Dec. 20	Jan. 21
5 years in 10 earlier than--	Nov. 22	Dec. 6	Jan. 3	*
7 years in 10 earlier than--	Nov. 29	Dec. 16	Jan. 23	*
9 years in 10 earlier than--	Dec. 9	Dec. 30	*	*

* Probability of occurrence of threshold temperature is less than indicated probability.

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-74 at Lake City, Florida)

Probability	Daily minimum temperature during growing season				
	Higher than 32 °F	Higher than 28 °F	Higher than 24 °F	Higher than 20 °F	Higher than 16 °F
	Days	Days	Days	Days	Days
9 years in 10	282	325	365	365	365
7 years in 10	266	308	365	365	365
5 years in 10	255	296	365	365	365
3 years in 10	243	285	328	365	365
1 year in 10	227	268	310	333	365

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
3	Pits	237	*
6	Blanton fine sand, moderately wet, 0 to 5 percent slopes	1,622	0.4
7	Troup-Bonneau-Penney complex, 5 to 8 percent slopes	1,090	0.3
8	Blanton fine sand, 0 to 5 percent slopes	257	*
11	Boulogne sand	3,695	1.0
16	Dasher mucky peat, depressional	3,973	1.1
17	Dorovan muck, frequently flooded	2,369	0.6
18	Surrency-Mulat complex, frequently flooded	8,970	2.4
20	Duplin loamy fine sand, 2 to 5 percent slopes	1,957	0.5
21	Hurricane and Ridgewood soils, 0 to 5 percent slopes	1,487	0.4
22	Leefield fine sand, 0 to 5 percent slopes	6,168	1.6
23	Leon sand	23,223	6.2
24	Leon-Evergreen complex, depressional	3,101	0.8
25	Kershaw sand, 2 to 5 percent slopes	226	*
26	Kingsferry and Allanton soils	2,263	0.6
28	Mandarin sand	526	0.1
29	Mascotte fine sand	74,603	19.8
30	Murville fine sand	531	0.1
32	Ocilla fine sand, 0 to 3 percent slopes	12,366	3.3
33	Olustee-Pelham complex	16,169	4.3
34	Ortega sand, 0 to 5 percent slopes	399	0.1
35	Ousley fine sand, 2 to 5 percent slopes, occasionally flooded	360	0.1
36	Pantego-Pamlico, loamy substratum, complex, depressional	68,084	18.1
37	Pelham fine sand	45,448	12.1
39	Plummer fine sand	4,340	1.2
40	Pamlico muck, loamy substratum, depressional	23,820	6.3
42	Pottsburg sand, high	2,923	0.8
43	Pottsburg sand	6,305	1.7
44	Rains loamy fine sand	1,025	0.3
46	Osier fine sand, frequently flooded	4,417	1.2
47	Sapelo fine sand	26,527	7.1
51	Leon fine sand, occasionally flooded	157	*
52	Mascotte-Pamlico, loamy substratum, complex, depressional	18,557	4.9
53	Mascotte fine sand, low	1,135	0.3
54	Albany fine sand, 0 to 5 percent slopes	5,543	1.5
	Water areas less than 40 acres in size	636	0.2
	Water areas more than 40 acres in size	1,750	0.5
	Total	376,259	100.0

* Less than 0.05 percent. The combined extent of the soils assigned an asterisk in the "Percent" column is about 0.1 percent of the survey area.

TABLE 5.--LAND CAPABILITY 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	Corn	Pecans	Tobacco	Soybeans	Watermelons	Bahiagrass	Improved bermuda-grass
		Bu	Cwt	Lbs	Bu	Tons	AUM*	AUM*
3**. Pits								
6---------------- Blanton	IIIs	60	4.0	2,000	25	12	6.5	7.0
7---------------- Troup-Bonneau-Penney	IVs	50	3.5	1,250	20	4	7.5	7.5
8---------------- Blanton	IIIs	60	3.5	1,900	25	12	6.5	8.0
11--------------- Boulogne	IIIw	60	4.0	1,750	30	6	8.5	7.5
16--------------- Dasher	VIIw	---	---	---	---	---	---	---
17--------------- Dorovan	VIIw	---	---	---	---	---	---	---
18--------------- Surrency-Mulat	Vw	---	---	---	---	---	---	---
20--------------- Duplin	IIe	100	---	2,800	45	---	9.0	9.0
21--------------- Hurricane and Ridgewood	IIIw	55	4.0	2,000	25	6	7.5	7.0
22--------------- Leefield	IIw	85	5.0	2,600	35	12	8.0	9.0
23--------------- Leon	IVw	50	3.5	1,500	20	5	7.5	6.5
24--------------- Leon-Evergreen	VIIw	---	---	---	---	---	---	---
25--------------- Kershaw	VIIs	---	---	---	---	---	3.5	3.5
26--------------- Kingsferry and Allanton	IVw	---	---	---	---	---	7.5	6.0
28--------------- Mandarin	VIs	---	---	---	---	---	6.0	3.5
29--------------- Mascotte	IIIw	50	4.0	1,500	20	5	8.0	7.5
30--------------- Murville	Vw	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Pecans	Tobacco	Soybeans	Watermelons	Bahiagrass	Improved bermuda-grass
		Bu	Cwt	Lbs	Bu	Tons	AUM*	AUM*
32-------------- Ocilla	IIIw	75	5.0	2,500	35	12	7.5	8.5
33-------------- Olustee-Pelham	IIIw	75	4.0	1,750	30	5	7.0	6.5
34-------------- Ortega	IIIs	55	3.0	1,800	20	10	6.0	6.5
35-------------- Ousley	IIIw	50	4.0	1,500	20	5	6.0	7.0
36-------------- Pantego-Pamlico	VIIw	---	---	---	---	---	---	---
37-------------- Pelham	IIIw	75	4.0	1,750	30	5	7.0	6.5
39-------------- Plummer	IVw	70	4.0	1,750	30	5	6.5	6.0
40-------------- Pamlico	VIIw	---	---	---	---	---	---	---
42-------------- Pottsburg	IVw	55	4.0	1,500	25	5	7.0	6.5
43-------------- Pottsburg	IVw	50	4.0	1,250	20	5	6.0	7.0
44-------------- Rains	IVw	---	---	---	---	---	8.5	7.5
46-------------- Osier	Vw	---	---	---	---	---	---	---
47-------------- Sapelo	IVw	50	4.0	1,500	20	5	7.5	7.5
51-------------- Leon	IVw	50	3.5	1,500	20	5	7.5	6.5
52-------------- Mascotte-Pamlico	VIIw	---	---	---	---	---	---	---
53-------------- Mascotte	IVw	---	---	---	---	---	7.0	7.5
54-------------- Albany	IIIe	70	5	2,000	20	12	6.5	7.0

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Potential productivity: Site quality**	Potential productivity: Productivity***	Trees to plant
							Ft^3/ac/yr		Cd/ac/yr	
6-------------------- Blanton	11S	Moderate	Moderate	Moderate	Slash pine--------	85	113	62	1.3	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine-----	85	113	---	---	
					Longleaf pine-----	75	88	---	---	
					Live oak----------	---	---	---	---	
					Bluejack oak------	---	---	---	---	
					Turkey oak--------	---	---	---	---	
					Southern red oak--	---	---	---	---	
7:										
Troup--------------	11S	Moderate	Moderate	Moderate	Slash pine--------	85	113	65	1.4	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine-----	85	113	---	---	
					Longleaf pine-----	79	100	---	---	
					Laurel oak--------	---	---	---	---	
					Southern red oak--	---	---	---	---	
					Live oak----------	---	---	---	---	
					Bluejack oak------	---	---	---	---	
Bonneau------------	11S	Moderate	Moderate	Moderate	Slash pine--------	90	121	70	1.6	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine-----	86	115	---	---	
					Longleaf pine-----	79	100	---	---	
					Laurel oak--------	---	---	---	---	
					Southern red oak--	---	---	---	---	
					Bluejack oak------	---	---	---	---	
Penney-------------	5S	Moderate	Moderate	Moderate	Longleaf pine-----	70	79	---	---	Sand pine, longleaf pine.
					Sand pine---------	80	---	---	---	
					Laurel oak--------	---	---	---	---	
					Bluejack oak------	---	---	---	---	
					Southern red oak--	---	---	---	---	
					Live oak----------	---	---	---	---	
8-------------------- Blanton	11S	Moderate	Moderate	Moderate	Slash pine--------	90	121	62	1.3	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine-----	85	113	---	---	
					Longleaf pine-----	70	79	---	---	
					Bluejack oak------	---	---	---	---	
					Turkey oak--------	---	---	---	---	
					Southern red oak--	---	---	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Site index	Volume* (Ft^3/ac/yr)	Site quality**	Productivity*** (Cd/ac/yr)	Trees to plant
11------------------ Boulogne	11W	Severe	Severe	Severe	Slash pine--------	85	113	70	1.6	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine-----	80	104	---	---	
					Longleaf pine-----	70	79	---	---	
					Water oak---------	---	---	---	---	
					Laurel oak--------	---	---	---	---	
17------------------ Dorovan	7W	Severe	Severe	Severe	Baldcypress-------	108	---	---	---	****
					Blackgum----------	---	---	---	---	
					Sweetbay----------	---	---	---	---	
					Pondcypress-------	---	---	---	---	
					Loblolly bay------	---	---	---	---	
					Red maple---------	---	---	---	---	
					Ogeechee lime-----	---	---	---	---	
18:										
Surrency-----------	7W	Severe	Severe	Severe	Baldcypress-------	108	---	---	---	****
					Blackgum----------	---	---	---	---	
					Sweetbay----------	---	---	---	---	
					Pondcypress-------	---	---	---	---	
					Loblolly bay------	---	---	---	---	
					Red maple---------	---	---	---	---	
					Ogeechee lime-----	---	---	---	---	
Mulat--------------	7W	Severe	Severe	Severe	Baldcypress-------	108	---	---	---	****
					Blackgum----------	---	---	---	---	
					Sweetbay----------	---	---	---	---	
					Pondcypress-------	---	---	---	---	
					Loblolly bay------	---	---	---	---	
					Red maple---------	---	---	---	---	
					Ogeechee lime-----	---	---	---	---	
20------------------ Duplin	9W	Moderate	Moderate	Moderate	Loblolly pine-----	90	121	68	1.5	Loblolly pine, slash pine.
					Slash pine--------	90	121	---	---	
					Sweetgum----------	---	---	---	---	
					Southern red oak--	---	---	---	---	
					Bluejack oak------	---	---	---	---	
					Laurel oak--------	---	---	---	---	
					Live oak----------	---	---	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Potential productivity: Site quality**	Potential productivity: Productivity***	Trees to plant
							Ft^3/ac/yr		Cd/ac/yr	
21:										
Hurricane	11W	Moderate	Moderate	Moderate	Slash pine	85	113	65	1.4	Slash pine, loblolly pine, longleaf pine.
					Longleaf pine	75	88	---	---	
					Loblolly pine	80	104	---	---	
					Blackjack oak	---	---	---	---	
					Sand post oak	---	---	---	---	
					Turkey oak	---	---	---	---	
Ridgewood	10W	Moderate	Moderate	Moderate	Slash pine	80	106	60	1.2	Slash pine, longleaf pine.
					Longleaf pine	65	67	---	---	
					Laurel oak	---	---	---	---	
					Live oak	---	---	---	---	
					Bluejack oak	---	---	---	---	
					Turkey oak	---	---	---	---	
					Southern red oak	---	---	---	---	
22 Leefield	11W	Moderate	Moderate	Moderate	Slash pine	90	121	70	1.6	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine	90	121	---	---	
					Longleaf pine	79	100	---	---	
					Bluejack oak	---	---	---	---	
					Southern red oak	---	---	---	---	
					Live oak	---	---	---	---	
					Laurel oak	---	---	---	---	
23 Leon	8W	Moderate	Moderate	Moderate	Slash pine	80	106	63	1.3	Slash pine, longleaf pine.
					Longleaf pine	70	79	---	---	
					Loblolly pine	75	95	---	---	
					Water oak	---	---	---	---	
					Laurel oak	---	---	---	---	
24:										
Leon	2W	Severe	Severe	Severe	Pondcypress	75	---	---	---	****
					Red maple	---	---	---	---	
					Blackgum	---	---	---	---	
					Sweetbay	---	---	---	---	
					Loblolly bay	---	---	---	---	
					Ogeechee lime	---	---	---	---	
					Water oak	---	---	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Potential productivity: Site quality**	Potential productivity: Productivity***	Trees to plant
							Ft^3/ac/yr		Cd/ac/yr	
24:										
Evergreen	2W	Severe	Severe	Severe	Pondcypress	75	---	---	---	****
					Red maple	---	---	---	---	
					Blackgum	---	---	---	---	
					Sweetbay	---	---	---	---	
					Loblolly bay	---	---	---	---	
					Ogeechee lime	---	---	---	---	
					Water oak	---	---	---	---	
25 Kershaw	3S	Moderate	Severe	Slight	Longleaf pine	55	45	---	---	Sand pine, longleaf pine.
					Sand pine	75	---	---	---	
					Turkey oak	---	---	---	---	
					Bluejack oak	---	---	---	---	
26:										
Kingsferry	11W	Severe	Severe	Severe	Slash pine	85	113	65	1.4	Slash pine*****.
					Loblolly pine	80	104	---	---	
					Sweetbay	---	---	---	---	
					Pond pine	---	---	---	---	
Allanton	11W	Severe	Severe	Severe	Slash pine	90	121	65	1.4	Slash pine*****.
					Loblolly pine	80	104	---	---	
					Sweetbay	---	---	---	---	
					Pond pine	---	---	---	---	
28 Mandarin	8S	Moderate	Severe	Moderate	Slash pine	65	79	55	1.0	Slash pine, longleaf pine.
					Longleaf pine	60	56	---	---	
					Live oak	---	---	---	---	
29 Mascotte	11W	Moderate	Moderate	Moderate	Slash pine	85	113	67	1.5	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine	80	104	---	---	
					Longleaf pine	70	79	---	---	
					Water oak	---	---	---	---	
					Laurel oak	---	---	---	---	
30 Murville	11W	Severe	Severe	Severe	Slash pine	85	121	65	1.4	Slash pine*****.
					Loblolly pine	80	104	---	---	
					Pond pine	---	---	---	---	
					Sweetbay	---	---	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Volume*	Site quality**	Productivity***	Trees to plant
							Ft^3/ac/yr		Cd/ac/yr	
32------------------ Ocilla	11W	Moderate	Moderate	Moderate	Slash pine--------	90	121	63	1.3	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine-----	85	113	---	---	
					Longleaf pine-----	75	88	---	---	
					Bluejack oak------	---	---	---	---	
					Southern red oak--	---	---	---	---	
					Live oak----------	---	---	---	---	
					Laurel oak--------	---	---	---	---	
33: Olustee------------	11W	Moderate	Moderate	Moderate	Slash pine--------	90	121	65	1.4	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine-----	80	104	---	---	
					Longleaf pine-----	75	88	---	---	
					Water oak---------	---	---	---	---	
					Laurel oak--------	---	---	---	---	
Pelham-------------	11W	Severe	Severe	Severe	Slash pine--------	90	121	65	1.4	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine-----	86	115	---	---	
					Longleaf pine-----	80	101	---	---	
					Laurel oak--------	---	---	---	---	
					Water oak---------	---	---	---	---	
34------------------ Ortega	10S	Moderate	Moderate	Moderate	Slash pine--------	80	106	60	1.2	Slash pine, longleaf pine.
					Longleaf pine-----	70	79	---	---	
					Blackjack oak-----	---	---	---	---	
					Sand post oak-----	---	---	---	---	
					Turkey oak--------	---	---	---	---	
35------------------ Ousley	10W	Moderate	Moderate	Moderate	Slash pine--------	80	106	55	1.0	Slash pine, longleaf pine.
					Loblolly pine-----	75	95	---	---	
					Laurel oak--------	---	---	---	---	
					Live oak----------	---	---	---	---	
					Water oak---------	---	---	---	---	
36: Pantego------------	2W	Severe	Severe	Severe	Pondcypress-------	75	---	---	---	****
					Sweetbay----------	---	---	---	---	
					Loblolly bay------	---	---	---	---	
					Blackgum----------	---	---	---	---	
					Red maple---------	---	---	---	---	
					Ogeechee lime-----	---	---	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Potential productivity: Site quality**	Potential productivity: Productivity***	Trees to plant
							Ft^3/ac/ yr		Cd/ac/ yr	
36:										
Pamlico	2W	Severe	Severe	Severe	Pondcypress	75	---	---	---	****
					Sweetbay	---	---	---	---	
					Loblolly bay	---	---	---	---	
					Blackgum	---	---	---	---	
					Red maple	---	---	---	---	
					Ogeechee lime	---	---	---	---	
37 Pelham	11W	Severe	Severe	Severe	Slash pine	90	121	65	1.4	Slash pine, loblolly pine.
					Loblolly pine	86	115	---	---	
					Longleaf pine	80	101	---	---	
					Water oak	---	---	---	---	
					Laurel oak	---	---	---	---	
39 Plummer	11W	Severe	Severe	Severe	Slash pine	88	118	65	1.4	Slash pine, loblolly pine.
					Loblolly pine	85	113	---	---	
					Longleaf pine	70	79	---	---	
					Water oak	---	---	---	---	
					Laurel oak	---	---	---	---	
40 Pamlico	2W	Severe	Severe	Severe	Pondcypress	75	---	---	---	****
					Blackgum	---	---	---	---	
					Red maple	---	---	---	---	
					Ogeechee lime	---	---	---	---	
					Sweetbay	---	---	---	---	
					Loblolly bay	---	---	---	---	
42 Pottsburg	10W	Moderate	Moderate	Moderate	Slash pine	80	106	65	1.4	Slash pine, longleaf pine.
					Loblolly pine	80	106	---	---	
					Longleaf pine	70	79	---	---	
					Laurel oak	---	---	---	---	
					Water oak	---	---	---	---	
43 Pottsburg	10W	Moderate	Moderate	Moderate	Slash pine	80	106	60	1.2	Slash pine, longleaf pine.
					Longleaf pine	65	67	---	---	
					Loblolly pine	70	87	---	---	
					Laurel oak	---	---	---	---	
					Water oak	---	---	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Site index	Volume*	Site quality**	Productivity***	Trees to plant
							Ft^3/ac/yr		Cd/ac/yr	
44-----------------Rains	12W	Severe	Severe	Severe	Slash pine--------	91	122	70	1.6	Loblolly pine, slash pine.
					Loblolly pine-----	94	130	---	---	
					Sweetgum----------	---	---	---	---	
					Laurel oak--------	---	---	---	---	
					Water oak---------	---	---	---	---	
46-----------------Osier	7W	Severe	Severe	Severe	Baldcypress-------	108	---	---	---	****
					Blackgum----------	---	---	---	---	
					Red maple---------	---	---	---	---	
					Ogeechee lime-----	---	---	---	---	
					Sweetbay----------	---	---	---	---	
					Loblolly bay------	---	---	---	---	
47-----------------Sapelo	11W	Moderate	Moderate	Moderate	Slash pine--------	85	113	66	1.5	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine-----	75	95	---	---	
					Longleaf pine-----	70	79	---	---	
					Laurel oak--------	---	---	---	---	
					Water oak---------	---	---	---	---	
51-----------------Leon	8W	Moderate	Moderate	Moderate	Slash pine--------	70	88	55	1.0	Slash pine, longleaf pine.
					Loblolly pine-----	65	80	---	---	
					Longleaf pine-----	60	56	---	---	
					Laurel oak--------	---	---	---	---	
					Water oak---------	---	---	---	---	
52:										
Mascotte-----------	2W	Severe	Severe	Severe	Pondcypress-------	75	---	---	---	****
					Pond pine---------	---	---	---	---	
					Sweetbay----------	---	---	---	---	
Pamlico------------	2W	Severe	Severe	Severe	Pondcypress-------	75	---	---	---	****
					Pond pine---------	---	---	---	---	
					Sweetbay----------	---	---	---	---	
53-----------------Mascotte	10W	Moderate	Moderate	Moderate	Slash pine--------	80	106	65	1.4	Slash pine, longleaf pine.
					Loblolly pine-----	80	104	---	---	
					Longleaf pine-----	70	79	---	---	
					Sweetbay----------	---	---	---	---	
					Loblolly bay------	---	---	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Potential productivity: Site quality**	Potential productivity: Productivity***	Trees to plant
							Ft^3/ac/yr		Cd/ac/yr	
54 Albany	11W	Moderate	Moderate	Moderate	Slash pine	85	113	62	1.3	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine	85	113	---	---	
					Longleaf pine	80	101	---	---	
					Laurel oak	---	---	---	---	
					Southern red oak	---	---	---	---	
					Bluejack oak	---	---	---	---	

* Volume yields expressed as average yearly growth per acre based on 50-year average of corresponding site index (29).

** Site quality estimates for slash pine (base year 25) (4).

*** Productivity expressed as average annual cords per acre based on 25-year average of corresponding site quality.

**** Reforestation generally is accomplished by natural regeneration because of severe management restrictions. Planting is generally not recommended.

***** Adequate surface drainage or bedding is needed to regenerate the forest stand through tree planting and to obtain potential productivity.

TABLE 7.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
3*. Pits					
6: Blanton	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
7*: Troup	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty.
Bonneau	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty.
Penney	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
8: Blanton	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
11: Boulogne	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
16: Dasher	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
17: Dorovan	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
18*: Surrency	Severe: flooding, too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, flooding.	Severe: wetness, too sandy.	Severe: flooding, wetness.
Mulat	Severe: flooding, too sandy, wetness.	Severe: wetness, too sandy.	Severe: too sandy, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding.
20: Duplin	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
21*: Hurricane	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
21*:					
Ridgewood	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
22 Leefield	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty.
23 Leon	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
24*:					
Leon	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Evergreen	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
25 Kershaw	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
26*:					
Kingsferry	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
Allanton	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
28 Mandarin	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty, too sandy.
29 Mascotte	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
30 Murville	Severe: wetness.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
32 Ocilla	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty, too sandy.
33*:					
Olustee	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
Pelham	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
34: Ortega	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
35: Ousley	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
36*:					
Pantego	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Pamlico	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
37: Pelham	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
39: Plummer	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
40: Pamlico	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
42: Pottsburg	Severe: wetness, too sandy.	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.	Severe: droughty.
43: Pottsburg	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
44: Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
46: Osier	Severe: wetness, too sandy, flooding.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding.
47: Sapelo	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
51: Leon	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
52*:					
Mascotte	Severe: ponding, excess humus.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, excess humus.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
52*:					
Pamlico	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
53 Mascotte	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
54 Albany	Severe: wetness, too sandy.	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.	Severe: droughty.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							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
3*. Pits										
6-----Blanton	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
7*:										
Troup-----	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Bonneau-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Penney-----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
8-----Blanton	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
11-----Boulogne	Poor	Fair	Fair	Poor	Fair	Poor	Fair	Fair	Fair	Poor.
16-----Dasher	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
17-----Dorovan	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
18*:										
Surrency-----	Poor	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair.
Mulat-----	Very poor.	Poor	Poor	Fair	Poor	Fair	Fair	Poor	Fair	Fair.
20-----Duplin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
21*:										
Hurricane-----	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
Ridgewood-----	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.
22-----Leefield	Fair	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
23-----Leon	Poor	Fair	Fair	Poor	Fair	Poor	Fair	Fair	Fair	Poor.
24*:										
Leon-----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Good	Very poor.	Very poor.	Good.
Evergreen-----	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
25------------------ Kershaw	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
26*:										
Kingsferry--------	Very poor.	Poor	Poor	Poor	Fair	Good	Good	Poor	Fair	Good.
Allanton----------	Poor	Poor	Poor	Fair	Fair	Good	Good	Poor	Fair	Good.
28------------------ Mandarin	Very poor.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.
29------------------ Mascotte	Poor	Fair	Fair	Poor	Fair	Poor	Fair	Fair	Fair	Poor.
30------------------ Murville	Very poor.	Poor	Poor	Poor	Poor	Good	Fair	Poor	Poor	Fair.
32------------------ Ocilla	Fair	Fair	Good	Fair	Good	Fair	Fair	Fair	Good	Fair.
33*:										
Olustee-----------	Poor	Fair	Fair	Poor	Fair	Poor	Fair	Fair	Fair	Poor.
Pelham------------	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
34------------------ Ortega	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
35------------------ Ousley	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
36*:										
Pantego-----------	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Very poor.	Poor	Good.
Pamlico-----------	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Very poor.	Poor	Good.
37------------------ Pelham	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
39------------------ Plummer	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
40------------------ Pamlico	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
42------------------ Pottsburg	Poor	Poor	Fair	Poor	Fair	Poor	Very poor.	Poor	Poor	Very poor.
43------------------ Pottsburg	Poor	Fair	Fair	Poor	Fair	Poor	Fair	Fair	Fair	Poor.
44------------------ Rains	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.
46------------------ Osier	Very poor.	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Fair.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
47----------------- Sapelo	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
51----------------- Leon	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
52*:										
Mascotte----------	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Good	Very poor.	Very poor.	Good.
Pamlico-----------	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Very poor.	Poor	Good.
53----------------- Mascotte	Poor	Fair	Fair	Poor	Fair	Poor	Fair	Fair	Fair	Poor.
54----------------- Albany	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
3*. Pits						
6----------------- Blanton	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Severe: droughty.
7*:						
Troup------------	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
Bonneau----------	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Moderate: slope.	Slight---------	Moderate: droughty.
Penney-----------	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: droughty.
8----------------- Blanton	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Severe: droughty.
11---------------- Boulogne	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
16---------------- Dasher	Severe: excess humus, ponding.	Severe: ponding, low strength, subsides.	Severe: ponding, low strength, subsides.	Severe: ponding, low strength, subsides.	Severe: ponding, subsides.	Severe: ponding, excess humus.
17---------------- Dorovan	Severe: excess humus, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, ponding, flooding.	Severe: ponding, flooding, excess humus.
18*:						
Surrency---------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.
Mulat------------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
20---------------- Duplin	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Slight.
21*:						
Hurricane--------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
Ridgewood--------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
22 Leefield	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
23 Leon	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
24*:						
Leon	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, excess humus.
Evergreen	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, excess humus.
25 Kershaw	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
26*:						
Kingsferry	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Allanton	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
28 Mandarin	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty, too sandy.
29 Mascotte	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
30 Murville	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
32 Ocilla	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty, too sandy.
33*:						
Olustee	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Pelham	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
34 Ortega	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
35------- Ousley	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: droughty.
36*:						
Pantego----------	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Pamlico----------	Severe: cutbanks cave, excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: low strength, ponding.	Severe: ponding, excess humus.
37------- Pelham	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
39------- Plummer	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
40------- Pamlico	Severe: cutbanks cave, excess humus, ponding.	Severe: ponding, flooding.	Severe: ponding, flooding.	Severe: flooding, ponding.	Severe: low strength, ponding.	Severe: ponding, excess humus.
42------- Pottsburg	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Severe: droughty.
43------- Pottsburg	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
44------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
46------- Osier	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.
47------- Sapelo	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
51------- Leon	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness.
52*:						
Mascotte---------	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, excess humus.
Pamlico----------	Severe: cutbanks cave, excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding, low strength.	Severe: low strength, ponding.	Severe: ponding, excess humus.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
53---------------- Mascotte	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
54---------------- Albany	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Severe: droughty.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
3*. Pits					
6 Blanton	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: too sandy.	Severe: seepage.	Poor: too sandy.
7*:					
Troup	Slight	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Bonneau	Moderate: wetness.	Severe: seepage.	Severe: wetness.	Severe: seepage.	Good.
Penney	Slight**	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
8 Blanton	Moderate: wetness.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: too sandy.
11 Boulogne	Severe: wetness, percs slowly, poor filter.	Severe: seepage.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
16 Dasher	Severe: ponding, subsides.	Severe: flooding, excess humus, ponding.	Severe: ponding, seepage, excess humus.	Severe: seepage, ponding.	Poor: ponding, seepage, excess humus.
17 Dorovan	Severe: subsides, flooding, ponding.	Severe: flooding, excess humus, ponding.	Severe: flooding, seepage, ponding.	Severe: seepage, flooding, ponding.	Poor: ponding, seepage, excess humus.
18*:					
Surrency	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, too sandy.	Severe: flooding, seepage, wetness.	Poor: too sandy, wetness.
Mulat	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness, thin layer.
20 Duplin	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, hard to pack, wetness.

See footnotes at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
21*:					
Hurricane	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
Ridgewood	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
22 Leefield	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
23 Leon	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
24*:					
Leon	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
Evergreen	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
25 Kershaw	Slight**	Severe: seepage.	Severe: too sandy, seepage.	Severe: seepage.	Poor: seepage, too sandy.
26*:					
Kingsferry	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Allanton	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
28 Mandarin	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: wetness, seepage.	Poor: seepage, too sandy.
29 Mascotte	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness, thin layer.
30 Murville	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.

See footnotes at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
32: Ocilla	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
33*:					
Olustee	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Pelham	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: wetness, seepage.	Poor: wetness.
34: Ortega	Moderate**: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
35: Ousley	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy.
36*:					
Pantego	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
Pamlico	Severe: ponding, poor filter.	Severe: seepage, flooding, excess humus.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
37: Pelham	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: wetness, seepage.	Poor: wetness.
39: Plummer	Severe: wetness, poor filter, percs slowly.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, wetness.
40: Pamlico	Severe: ponding, poor filter.	Severe: excess humus, ponding, seepage.	Severe: ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
42, 43: Pottsburg	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
44: Rains	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
46: Osier	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, seepage.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.

See footnotes at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
47------------------- Sapelo	Severe: wetness, poor filter, percs slowly.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
51------------------- Leon	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
52*:					
Mascotte------------	Severe: ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding.	Severe: seepage, ponding.	Poor: ponding.
Pamlico-------------	Severe: ponding, poor filter.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
53------------------- Mascotte	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness.
54------------------- Albany	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.
** Ground-water contamination is a hazard in areas where there are many septic tanks because of the poor filtering capacity of the soil.

TABLE 11.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
3*. Pits				
6---------------------- Blanton	Fair: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy.
7*:				
Troup----------------	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: too sandy.
Bonneau--------------	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
Penney---------------	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: too sandy.
8---------------------- Blanton	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: too sandy.
11--------------------- Boulogne	Poor: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy, wetness.
16--------------------- Dasher	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
17--------------------- Dorovan	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
18*:				
Surrency-------------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
Mulat----------------	Poor: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy, wetness.
20--------------------- Duplin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
21*:				
Hurricane------------	Fair: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy.
Ridgewood------------	Fair: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy.
22--------------------- Leefield	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
23 Leon	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
24*:				
Leon	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Evergreen	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
25 Kershaw	Good	Probable	Improbable: too sandy.	Severe: seepage.
26*:				
Kingsferry	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Allanton	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
28 Mandarin	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
29 Mascotte	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
30 Murville	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
32 Ocilla	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
33*:				
Olustee	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
Pelham	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
34 Ortega	Good	Probable	Improbable: too sandy.	Poor: too sandy.
35 Ousley	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
36*:				
Pantego	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Pamlico	Poor: low strength, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: excess humus, wetness.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
37: Pelham	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
39: Plummer	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
40: Pamlico	Poor: low strength, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: excess humus, wetness.
42: Pottsburg	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
43: Pottsburg	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
44: Rains	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
46: Osier	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
47: Sapelo	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: too sandy, wetness.
51: Leon	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
52*:				
Mascotte	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
Pamlico	Poor: low strength, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: excess humus, wetness.
53: Mascotte	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
54: Albany	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
3*. Pits							
6----------------- Blanton	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Cutbanks cave	Wetness, droughty.	Wetness, too sandy.	Droughty.
7*:							
Troup------------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Too sandy, soil blowing.	Droughty.
Bonneau----------	Severe: seepage.	Severe: thin layer.	Severe: cutbanks cave.	Deep to water	Slope, droughty, fast intake.	Soil blowing---	Droughty.
Penney-----------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
8----------------- Blanton	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
11---------------- Boulogne	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
16---------------- Dasher	Severe: seepage.	Severe: seepage, excess humus, ponding.	Slight---------	Ponding, subsides.	Ponding--------	Ponding--------	Wetness.
17---------------- Dorovan	Moderate: seepage.	Severe: excess humus, ponding.	Slight---------	Ponding, flooding, subsides.	Ponding, soil blowing, flooding.	Ponding, soil blowing.	Wetness.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
18*:							
Surrency	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Droughty, fast intake, wetness.	Too sandy, wetness.	Wetness, droughty, rooting depth.
Mulat	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, flooding.	Wetness, droughty, fast intake.	Wetness, percs slowly.	Wetness, droughty, percs slowly.
20 Duplin	Moderate: slope.	Moderate: piping, hard to pack, wetness.	Severe: slow refill.	Slope	Wetness, fast intake, slope.	Wetness	Favorable.
21*:							
Hurricane	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, too sandy, soil blowing.	Droughty.
Ridgewood	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, too sandy, soil blowing.	Droughty.
22 Leefield	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Favorable	Wetness, droughty, fast intake.	Wetness	Droughty.
23 Leon	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, too sandy, soil blowing.	Wetness, droughty.
24*:							
Leon	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, subsides, cutbanks cave.	Ponding, droughty.	Ponding, too sandy.	Wetness, droughty.
Evergreen	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, subsides, cutbanks cave.	Ponding	Ponding, too sandy.	Wetness.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
25: Kershaw	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Too sandy, soil blowing.	Droughty.
26*:							
Kingsferry	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, fast intake, soil blowing.	Wetness, too sandy, soil blowing.	Wetness.
Allanton	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
28: Mandarin	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Too sandy, soil blowing, wetness.	Droughty.
29: Mascotte	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Favorable	Wetness, droughty, fast intake.	Wetness, soil blowing.	Wetness, droughty, rooting depth.
30: Murville	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty, rooting depth.
32: Ocilla	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Favorable	Wetness, droughty, fast intake.	Wetness	Droughty.
33*:							
Olustee	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Pelham	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Favorable	Fast intake, wetness.	Wetness, soil blowing.	Wetness.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
34: Ortega	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
35: Ousley	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty.	Wetness, too sandy.	Droughty.
36*:							
Pantego	Moderate: seepage.	Severe: ponding, piping.	Moderate: slow refill.	Favorable	Ponding	Ponding	Ponding.
Pamlico	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, subsides, cutbanks cave.	Ponding, soil blowing.	Ponding, too sandy, soil blowing.	Wetness.
37: Pelham	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Favorable	Fast intake, wetness.	Wetness, soil blowing.	Wetness.
39: Plummer	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
40: Pamlico	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, subsides, cutbanks cave.	Ponding	Ponding	Ponding.
42, 43: Pottsburg	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
44: Rains	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Favorable	Wetness, droughty, fast intake.	Wetness, soil blowing.	Wetness, droughty.
46: Osier	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
47: Sapelo	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
51: Leon	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
52*:							
Mascotte	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: slow refill, cutbanks cave.	Ponding	Ponding, rooting depth.	Ponding	Wetness, rooting depth.
Pamlico	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, subsides, cutbanks cave.	Ponding, soil blowing.	Ponding, too sandy, soil blowing.	Wetness.
53: Mascotte	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Favorable	Wetness, droughty, fast intake.	Wetness, soil blowing.	Wetness, droughty, rooting depth.
54: Albany	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, too sandy.	Wetness, droughty.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--			Liquid limit	Plasticity index
			Unified	AASHTO	10	40	200		
	In							Pct	
3*. Pits									
6---------------- Blanton	0-73	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2	90-100	65-100	5-20	---	NP
	73-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SC-SM, SM	A-4, A-2, A-6, A-7	95-100	65-100	25-50	14-45	3-22
7*:									
Troup-----------	0-55	Fine sand--------	SM, SP-SM	A-2	90-100	50-75	10-30	---	NP
	55-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SC-SM, CL-ML, CL, SM	A-4, A-2, A-6	90-100	60-90	24-55	19-40	4-20
Bonneau---------	0-26	Fine sand--------	SM, SP-SM	A-2, A-3	100	60-95	8-20	---	NP
	26-31	Sandy clay loam, fine sandy loam.	SC, SC-SM	A-2, A-6, A-4	100	60-100	30-50	21-40	4-21
	31-80	Sandy clay loam, sandy clay.	CL, SC, SC-SM, CL-ML	A-4, A-6, A-2	100	60-95	25-60	20-40	4-18
Penney----------	0-50	Fine sand--------	SP, SP-SM	A-3	95-100	75-100	2-8	---	NP
	50-80	Fine sand--------	SP-SM	A-3, A-2-4	95-100	75-100	5-12	---	NP
8---------------- Blanton	0-43	Fine sand, sand	SP-SM, SM	A-3, A-2-4	90-100	65-100	5-20	---	NP
	43-63	Sandy loam, loamy sand.	SM	A-2-4	95-100	65-96	13-30	<25	NP-3
	63-80	Sandy clay loam, sandy loam, sandy clay.	SC, SC-SM, SM	A-4, A-2-4, A-2-6, A-6	95-100	69-100	25-50	12-45	3-22
11--------------- Boulogne	0-6	Fine sand, sand	SP, SP-SM	A-3	100	85-100	3-10	---	NP
	6-11	Sand, fine sand	SP-SM, SM, SP	A-3, A-2-4	100	85-100	3-20	---	NP
	11-49	Sand, fine sand	SP-SM, SP	A-3	100	85-100	3-10	---	NP
	49-80	Sand, fine sand, loamy fine sand, loamy sand.	SP-SM, SM	A-2-4	100	85-95	12-20	---	NP
16--------------- Dasher	0-80	Mucky peat-------	PT	---	---	---	---	---	NP
17--------------- Dorovan	0-80	Muck-------------	PT	---	---	---	---	---	---
18*:									
Surrency--------	0-8	Mucky fine sand	SP-SM, SM, SC-SM	A-3, A-2-4	95-100	50-100	5-20	<20	NP-5
	8-28	Loamy sand, sand, fine sand.	SP-SM, SM	A-2-4	95-100	50-100	10-26	---	NP
	28-48	Sandy loam, sandy clay loam.	SM, SC-SM, SC	A-2	95-100	75-100	22-35	<30	NP-10
	48-80	Sandy clay loam	SM, SC, SC-SM	A-2, A-4, A-6	95-100	80-100	30-44	<35	NP-15

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--			Liquid limit	Plasticity index
			Unified	AASHTO	10	40	200		
	In							Pct	
18*:									
Mulat	0-6	Mucky fine sand	SP-SM	A-3, A-2-4	100	80-100	5-12	---	NP
	6-28	Loamy fine sand, fine sand.	SM, SP-SM	A-3, A-2-4	100	80-100	8-20	---	NP
	28-55	Fine sandy loam, sandy clay loam.	SC-SM, SC, SM	A-2-4	100	80-100	20-35	20-30	NP-10
	55-80	Fine sand, sand, loamy sand.	SP, SP-SM, SM	A-3, A-2-4	100	75-100	4-20	---	NP
20 Duplin	0-10	Loamy fine sand	SM, SP-SM	A-2, A-3	90-100	65-95	5-35	---	NP
	10-70	Sandy clay, clay	CL, CH, SC	A-6, A-7	98-100	80-100	45-75	24-54	13-35
21*:									
Hurricane	0-8	Sand	SP, SP-SM	A-3	100	78-100	4-8	---	NP
	8-74	Sand, fine sand	SP, SP-SM	A-3	100	78-100	4-8	---	NP
	74-80	Sand, fine sand, loamy sand.	SP-SM, SM, SP	A-3, A-2-4	100	80-100	4-15	---	NP
Ridgewood	0-4	Fine sand	SP-SM	A-3, A-2-4	100	90-100	5-12	---	NP
	4-80	Fine sand, sand	SP-SM, SP	A-3, A-2-4	100	90-100	2-12	---	NP
22 Leefield	0-28	Fine sand, loamy fine sand.	SM, SW-SM, SP-SM	A-2	95-100	65-95	10-20	---	NP
	28-35	Fine sandy loam, sandy clay loam.	SC, SM, SC-SM	A-2, A-4, A-6	93-100	65-95	20-40	<40	NP-16
	35-80	Fine sandy loam, sandy clay loam.	SC, SM, SC-SM	A-2, A-4, A-6	95-100	65-90	20-40	<40	NP-21
23 Leon	0-17	Sand, fine sand	SP, SP-SM	A-3, A-2-4	100	80-100	2-12	---	NP
	17-26	Sand, fine sand, loamy sand, loamy fine sand.	SM, SP-SM, SP	A-3, A-2-4	100	80-100	3-20	---	NP
	26-31	Sand, fine sand	SP, SP-SM	A-3, A-2-4	100	80-100	2-12	---	NP
	31-80	Sand, fine sand, loamy sand, loamy fine sand.	SM, SP-SM, SP	A-3, A-2-4	100	80-100	3-20	---	NP
24*:									
Leon	0-5	Muck	PT	---	---	---	---	---	---
	5-26	Sand, fine sand	SP, SP-SM	A-3, A-2-4	100	80-100	2-12	---	NP
	26-80	Sand, fine sand, loamy fine sand, loamy sand.	SM, SP-SM, SP	A-3, A-2-4	100	80-100	3-20	---	NP
Evergreen	0-14	Muck	PT	---	---	---	---	---	---
	14-40	Sand, fine sand	SP, SP-SM	A-3	100	80-100	1-10	---	NP
	40-65	Sand, fine sand, loamy fine sand, loamy sand.	SP, SP-SM	A-3	100	80-100	1-10	---	NP
25 Kershaw	0-80	Sand, fine sand	SP, SP-SM, SW	A-2, A-3	98-100	50-80	1-7	---	NP
26*:									
Kingsferry	0-34	Fine sand	SP, SP-SM	A-3	100	85-100	3-10	---	NP
	34-80	Sand, fine sand, loamy fine sand, loamy sand.	SP-SM, SM	A-2-4	100	85-95	12-20	---	NP

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Percentage passing sieve number-- 10	40	200	Liquid limit	Plasticity index
	In							Pct	
26*:									
Allanton--------	0-22	Fine sand--------	SP, SP-SM	A-3	100	80-100	2-5	---	NP
	22-60	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	100	80-100	2-12	---	NP
	60-80	Sand, fine sand, loamy sand.	SP-SM, SM	A-3, A-2-4	100	80-100	5-20	---	NP
28--------------- Mandarin	0-24	Sand, fine sand	SP, SP-SM	A-3	100	90-100	2-10	---	NP
	24-32	Fine sand, sand, loamy sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	100	90-100	5-15	---	NP
	32-70	Fine sand, sand	SP, SP-SM	A-3	100	90-100	2-7	---	NP
	70-80	Fine sand, sand, loamy sand, loamy fine sand.	SP, SP-SM	A-3, A-2-4	100	90-100	3-12	---	NP
29--------------- Mascotte	0-6	Fine sand--------	SP-SM	A-3, A-2-4	100	85-100	5-12	---	NP
	6-18	Fine sand--------	SP-SM, SP	A-3, A-2-4	100	85-100	4-12	---	NP
	18-24	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	100	85-100	8-15	---	NP
	24-38	Fine sandy loam, sand, loamy fine sand.	SP-SM	A-3, A-2-4	100	85-100	5-12	---	NP
	38-56	Sandy clay loam, fine sandy loam.	SC, SC-SM, SM	A-2, A-4, A-6	100	85-100	19-45	<38	NP-15
	56-80	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	100	85-100	8-15	---	NP
30--------------- Murville	0-10	Fine sand--------	SP-SM, SM	A-2, A-3	100	85-100	5-30	---	NP
	10-42	Fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	100	85-100	5-20	---	NP
	42-80	Fine sand--------	SP-SM, SP	A-2, A-3	100	80-100	3-12	---	NP
32--------------- Ocilla	0-26	Fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	95-100	70-100	8-35	---	NP
	26-32	Sandy clay loam, fine sandy loam.	SM, CL, SC, ML	A-2, A-4, A-6	95-100	80-100	20-55	20-40	NP-22
	32-80	Sandy clay loam, sandy clay, fine sandy loam.	SC, CL	A-4, A-6, A-7	95-100	80-100	36-60	20-45	7-20
33*:									
Olustee---------	0-8	Fine sand--------	SP-SM, SM	A-3, A-2-4	100	75-100	5-15	---	NP
	8-14	Sand, fine sand	SP-SM, SM	A-3, A-2-4	100	75-100	8-15	---	NP
	14-37	Sand, fine sand	SP-SM, SM	A-3, A-2-4	100	75-100	5-17	---	NP
	37-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM	A-2, A-4, A-6	100	85-100	30-45	21-38	8-15
Pelham----------	0-35	Fine sand--------	SM, SP-SM	A-2	95-100	75-100	10-25	---	NP
	35-45	Sandy clay loam, sandy loam, fine sandy loam.	SM, SC, SC-SM	A-2, A-4, A-6	95-100	65-100	27-50	15-30	2-12
	45-80	Sandy clay loam, sandy loam, sandy clay.	SC, SM, ML, CL	A-2, A-4, A-6, A-7	95-100	65-100	27-65	20-45	3-20
34--------------- Ortega	0-6	Sand, fine sand	SP, SP-SM	A-3	100	90-100	3-8	---	NP
	6-80	Fine sand, sand	SP, SP-SM	A-3	100	90-100	2-7	---	NP

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Percentage passing sieve number--: 10	40	200	Liquid limit	Plasticity index
	In							Pct	
35---------------- Ousley	0-10	Fine sand--------	SP-SM, SM	A-2, A-3	100	70-100	5-25	---	NP
	10-80	Sand, fine sand	SP-SM, SM, SP	A-2, A-3	95-100	60-99	2-15	---	NP
36*:									
Pantego----------	0-5	Muck-------------	PT	---	---	---	---	---	---
	5-8	Mucky fine sandy loam.	SM, ML	A-2, A-4	95-100	60-95	25-75	<35	NP-10
	8-26	Sandy clay loam, sandy loam, clay loam.	SC, CL, SC-SM, CL-ML	A-4, A-6, A-2	95-100	65-100	30-80	20-40	4-16
	26-80	Clay loam, sandy clay, sandy clay loam.	CL, SC	A-6, A-7	95-100	80-100	36-80	25-49	11-24
Pamlico----------	0-18	Muck-------------	PT	---	---	---	---	---	---
	18-42	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	100	70-95	5-20	---	NP
	42-55	Fine sandy loam, sandy clay loam.	SM, SC	A-4, A-2-6	100	80-100	20-49	20-35	2-15
	55-80	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	100	70-95	5-20	---	NP
37---------------- Pelham	0-26	Fine sand, loamy fine sand.	SM, SP-SM	A-2	95-100	75-100	10-25	---	NP
	26-33	Sandy clay loam, sandy loam, fine sandy loam.	SM, SC, SC-SM	A-2, A-4, A-6	95-100	65-100	27-50	15-30	2-12
	33-80	Sandy clay loam, sandy loam, sandy clay.	SC, SM, ML, CL	A-2, A-4, A-6, A-7	95-100	65-100	27-65	20-45	3-20
39---------------- Plummer	0-45	Fine sand--------	SM, SP-SM	A-2-4, A-3	100	75-90	5-20	---	NP
	45-80	Sandy clay loam, fine sandy loam.	SM, SC, SC-SM	A-2-4, A-4	97-100	76-96	20-48	<30	NP-10
40---------------- Pamlico	0-18	Muck-------------	PT	---	---	---	---	---	---
	18-42	Fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	100	70-95	5-20	---	NP
	42-55	Fine sandy loam, sandy clay loam.	SM, SC	A-4, A-2-6	100	90-100	20-49	20-35	2-15
	55-80	Fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	100	70-95	5-20	---	NP
42---------------- Pottsburg	0-52	Sand, fine sand	SP, SP-SM	A-3	100	90-100	2-9	---	NP
	52-80	Sand, fine sand	SP-SM, SP	A-3	100	90-100	4-9	---	NP
43---------------- Pottsburg	0-8	Sand, fine sand	SP, SP-SM	A-3	100	80-100	2-10	---	NP
	8-53	Sand, fine sand	SP, SP-SM	A-3	100	80-100	1-8	---	NP
	53-80	Sand, fine sand, loamy sand, loamy fine sand.	SP-SM, SP, SM	A-3, A-2-4	100	80-100	4-18	---	NP
44---------------- Rains	0-15	Loamy fine sand	SM	A-2	95-100	55-98	15-35	<30	NP-4
	15-20	Sandy clay loam, fine sandy loam, clay loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	95-100	55-98	30-70	18-40	4-20
	20-60	Sandy clay loam, clay loam, sandy clay.	SC, SC-SM, CL, CL-ML	A-4, A-6, A-7	98-100	60-98	36-72	18-45	4-28

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Percentage passing sieve number--: 10	40	200	Liquid limit	Plasticity index
	In							Pct	
46---------------Osier	0-6	Fine sand---------	SP-SM	A-2, A-3	98-100	60-85	5-12	---	NP
	6-80	Fine sand, loamy fine sand.	SP-SM, SM	A-2, A-3	95-100	65-96	5-20	---	NP
47---------------Sapelo	0-18	Fine sand---------	SM, SP, SP-SM	A-2, A-3	100	85-100	4-20	---	NP
	18-26	Fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	100	80-100	8-20	---	NP
	26-48	Fine sand---------	SM, SP, SP-SM	A-2, A-3	100	75-100	4-20	---	NP
	48-80	Sandy clay loam, fine sandy loam.	SM, SC, SC-SM	A-4, A-6, A-2	100	80-100	20-50	<40	NP-20
51---------------Leon	0-5	Fine sand---------	SP, SP-SM	A-3, A-2-4	100	80-100	2-12	---	NP
	5-25	Fine sand, sand	SP, SP-SM	A-3, A-2-4	100	80-100	2-12	---	NP
	25-40	Fine sand, sand, loamy sand.	SP, SM, SP-SM	A-3, A-2-4	100	80-100	3-20	---	NP
	40-80	Fine sand, sand	SP, SP-SM	A-3, A-2-4	100	80-100	2-12	---	NP
52*:									
Mascotte---------	0-6	Muck--------------	PT	---	---	---	---	---	---
	6-22	Fine sand---------	SP-SM	A-3, A-2-4	100	85-100	5-12	---	NP
	22-38	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	100	85-100	8-15	---	NP
	38-80	Fine sandy loam, sandy clay loam.	SM, SC-SM, SC	A-4, A-6, A-2-4, A-2-6	100	85-100	19-45	<38	NP-15
Pamlico----------	0-25	Muck--------------	PT	---	---	---	---	---	---
	25-50	Sand, fine sand, loamy sand.	SM, SP-SM	A-2, A-3	100	70-95	5-20	---	NP
	50-80	Fine sandy loam, sandy clay loam.	SM, SC	A-4, A-2-6	100	90-100	20-49	20-35	2-15
53---------------Mascotte	0-9	Fine sand---------	SP-SM	A-3, A-2-4	100	85-100	5-12	---	NP
	9-16	Fine sand---------	SP-SM, SP	A-3, A-2-4	100	85-100	4-12	---	NP
	16-29	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	100	85-100	8-15	---	NP
	29-36	Fine sand, sand	SP-SM, SM	A-3, A-2-4	100	85-100	8-15	---	NP
	36-80	Sandy clay loam, fine sandy loam.	SC-SM, SM, SC	A-2-4, A-4, A-6, A-2-6	100	85-100	19-45	<38	NP-15
54---------------Albany	0-59	Fine sand, loamy fine sand.	SM, SP-SM	A-2	100	75-90	10-20	---	NP
	59-65	Sandy loam--------	SM	A-2	100	75-92	22-30	---	NP
	65-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM, SC-SM	A-2, A-4, A-6	95-100	70-100	20-50	<40	NP-17

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--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)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
3*. Pits											
6----------------- Blanton	0-73	1-7	1.40-1.65	6.0-20	0.03-0.07	4.5-6.0	Low-----------	0.10	5	1	.5-2
	73-80	12-30	1.60-1.70	0.06-0.2	0.10-0.15	4.5-6.0	Low-----------	0.20			
7*:											
Troup------------	0-55	1-10	1.30-1.70	6.0-20	0.05-0.10	4.5-6.0	Low-----------	0.10	5	1	<1
	55-80	15-35	1.40-1.60	0.6-2.0	0.10-0.13	4.5-5.5	Low-----------	0.20			
Bonneau----------	0-26	2-8	1.30-1.70	6.0-20	0.04-0.08	4.5-6.0	Low-----------	0.10	5	1	.5-2
	26-31	13-35	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low-----------	0.20			
	31-80	15-40	1.40-1.60	0.6-2.0	0.10-0.16	4.5-5.5	Low-----------	0.20			
Penney-----------	0-2	0-3	1.30-1.55	6.0-20	0.04-0.08	3.6-6.0	Low-----------	0.10	5	1	0-2
	2-50	0-3	1.35-1.65	6.0-20	0.02-0.06	3.6-6.0	Low-----------	0.10			
	50-80	2-6	1.50-1.65	6.0-20	0.05-0.08	3.6-6.0	Low-----------	0.10			
8----------------- Blanton	0-43	1-7	1.30-1.60	6.0-20	0.03-0.07	4.5-6.0	Low-----------	0.10	5	1	.5-1
	43-63	10-18	1.50-1.65	2.0-6.0	0.10-0.15	4.5-6.0	Low-----------	0.15			
	63-80	12-40	1.60-1.70	0.2-2.0	0.10-0.15	4.5-6.0	Low-----------	0.20			
11---------------- Boulogne	0-6	1-7	1.30-1.55	6.0-20	0.10-0.15	3.6-6.0	Low-----------	0.10	5	1	1-5
	6-11	1-8	1.50-1.65	2.0-6.0	0.10-0.15	3.6-6.0	Low-----------	0.20			
	11-49	1-4	1.50-1.70	6.0-20	0.05-0.10	3.6-6.0	Low-----------	0.10			
	49-80	1-12	1.50-1.70	0.06-0.2	0.10-0.25	3.6-6.0	Low-----------	0.24			
16---------------- Dasher	0-80	---	---	2.0-6.0	0.20-0.25	3.6-4.4	Low-----------	0.10	2	8	>40
17---------------- Dorovan	0-80	---	0.35-0.55	0.6-2.0	0.20-0.25	3.6-4.4	Low-----------	0.10	2	8	>40
18*:											
Surrency---------	0-8	2-8	0.80-1.25	6.0-20	0.15-0.30	3.6-5.0	Low-----------	0.10	5	8	10-20
	8-28	<10	1.50-1.65	2.0-20	0.05-0.10	3.6-5.0	Low-----------	0.10			
	28-48	10-23	1.60-1.85	0.6-6.0	0.06-0.10	3.6-5.5	Low-----------	0.15			
	48-80	22-35	1.65-1.85	0.6-2.0	0.10-0.15	3.6-5.5	Low-----------	0.15			
Mulat------------	0-6	2-5	1.00-1.25	2.0-20	0.15-0.25	3.6-6.0	Low-----------	0.10	5	8	6-12
	6-28	2-8	1.40-1.70	2.0-20	0.05-0.20	3.6-6.0	Low-----------	0.17			
	28-55	14-25	1.55-1.70	0.06-0.6	0.10-0.15	3.6-6.0	Low-----------	0.24			
	55-80	3-7	1.55-1.70	2.0-20	0.05-0.10	3.6-6.0	Low-----------	0.17			
20---------------- Duplin	0-10	10-15	1.45-1.65	2.0-6.0	0.06-0.10	4.5-6.0	Low-----------	0.20	2	---	.5-2
	10-70	35-60	1.25-1.40	0.2-0.6	0.13-0.18	4.5-6.0	Moderate------	0.28			
21*:											
Hurricane--------	0-8	1-4	1.40-1.60	>6.0	0.03-0.07	3.6-6.0	Low-----------	0.10	5	1	<2
	8-74	1-4	1.40-1.60	>6.0	0.03-0.07	3.6-6.0	Low-----------	0.10			
	74-80	2-8	1.55-1.65	2.0-6.0	0.10-0.15	3.6-6.0	Low-----------	0.15			
Ridgewood--------	0-4	1-3	1.35-1.55	6.0-20	0.05-0.10	4.5-7.3	Low-----------	0.10	5	1	<1
	4-80	0-5	1.35-1.65	6.0-20	0.03-0.08	4.5-7.3	Low-----------	0.10			

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
22-----------------Leefield	0-28	5-10	1.45-1.60	6.0-20	0.04-0.07	4.5-6.5	Low-----------	0.10	5	1	1-2
	28-35	15-25	1.50-1.65	0.6-2.0	0.10-0.13	4.5-5.5	Low-----------	0.15			
	35-80	15-30	1.50-1.70	0.2-0.6	0.08-0.12	4.5-5.5	Low-----------	0.10			
23-----------------Leon	0-7	1-5	1.30-1.45	6.0-20	0.05-0.15	3.6-6.5	Low-----------	0.10	5	1	.5-4
	7-17	<3	1.40-1.60	6.0-20	0.02-0.05	3.6-6.5	Low-----------	0.10			
	17-26	2-8	1.25-1.65	0.6-6.0	0.15-0.30	3.6-6.5	Low-----------	0.15			
	26-31	1-4	1.50-1.65	2.0-20	0.05-0.10	3.6-6.5	Low-----------	0.10			
	31-80	2-8	1.25-1.65	0.6-6.0	0.15-0.30	3.6-6.5	Low-----------	0.15			
24*:											
Leon------------	0-5	---	0.40-0.65	6.0-20	0.25-0.40	3.6-5.5	Low-----------	0.10	5	8	20-80
	5-26	0-3	1.40-1.65	6.0-20	0.02-0.05	3.6-5.5	Low-----------	0.10			
	26-80	2-8	1.50-1.70	0.6-6.0	0.05-0.10	3.6-5.5	Low-----------	0.15			
Evergreen--------	0-14	---	0.20-0.40	6.0-20	0.25-0.40	3.6-5.5	Low-----------	0.10	5	8	60-90
	14-40	1-8	1.40-1.70	6.0-20	0.10-0.20	3.6-5.5	Low-----------	0.10			
	40-65	1-5	1.50-1.65	0.6-2.0	0.10-0.25	3.6-5.5	Low-----------	0.10			
25-----------------Kershaw	0-80	1-5	1.35-1.60	>20	0.02-0.05	4.5-6.0	Very low-----	0.10	5	1	<1
26*:											
Kingsferry-------	0-34	1-7	1.40-1.55	6.0-20	0.10-0.15	3.6-5.5	Low-----------	0.10	5	1	1-5
	34-80	3-12	1.50-1.65	<0.2	0.10-0.15	3.6-5.5	Low-----------	0.15			
Allanton---------	0-22	3-8	1.35-1.45	2.0-6.0	0.05-0.15	3.6-5.5	Low-----------	0.10	5	1	2-5
	22-60	3-12	1.40-1.60	6.0-20	0.04-0.08	3.6-5.5	Low-----------	0.10			
	60-80	3-12	1.50-1.65	<0.2	0.10-0.15	3.6-5.5	Low-----------	0.15			
28-----------------Mandarin	0-24	0-3	1.35-1.45	6.0-20	0.03-0.07	3.6-6.0	Low-----------	0.10	5	1	<3
	24-32	2-9	1.45-1.60	0.6-2.0	0.10-0.15	3.6-6.0	Low-----------	0.15			
	32-70	0-3	1.35-1.45	6.0-20	0.03-0.07	3.6-6.0	Low-----------	0.10			
	70-80	2-9	1.45-1.60	0.6-2.0	0.10-0.15	3.6-6.0	Low-----------	0.15			
29-----------------Mascotte	0-6	0-5	1.20-1.50	6.0-20	0.05-0.15	3.6-5.5	Low-----------	0.10	5	1	2-7
	6-18	0-5	1.35-1.55	6.0-20	0.03-0.08	3.6-5.5	Low-----------	0.10			
	18-24	3-10	1.35-1.50	0.6-2.0	0.10-0.15	3.6-5.5	Low-----------	0.15			
	24-38	1-8	1.45-1.70	6.0-20	0.03-0.08	3.6-5.5	Low-----------	0.15			
	38-56	14-35	1.55-1.79	0.2-0.6	0.10-0.15	3.6-5.5	Low-----------	0.24			
	56-80	5-13	1.45-1.60	0.6-2.0	0.07-0.10	3.6-5.5	Low-----------	0.10			
30-----------------Murville	0-10	2-8	1.45-1.60	6.0-20	0.10-0.15	3.6-5.5	Low-----------	0.10	5	1	2-9
	10-42	2-8	1.60-1.75	2.0-6.0	0.10-0.15	3.6-5.5	Low-----------	0.10			
	42-60	2-8	1.60-1.75	6.0-20	0.04-0.17	3.6-5.5	Low-----------	0.10			
	60-80	2-8	1.60-1.75	0.6-2.0	0.10-0.15	3.6-5.5	Low-----------	0.10			
32-----------------Ocilla	0-26	3-10	1.45-1.65	2.0-20	0.05-0.07	4.5-5.5	Low-----------	0.10	5	1	1-2
	26-32	15-35	1.55-1.70	0.6-2.0	0.09-0.12	4.5-5.5	Low-----------	0.24			
	32-80	15-40	1.55-1.70	0.2-2.0	0.09-0.12	4.5-5.5	Low-----------	0.24			
33*:											
Olustee----------	0-8	1-8	1.10-1.40	6.0-20	0.05-0.10	3.6-5.5	Low-----------	0.10	5	1	2-6
	8-14	2-8	1.35-1.55	2.0-6.0	0.10-0.15	3.6-5.5	Low-----------	0.15			
	14-37	2-8	1.35-1.50	6.0-20	0.03-0.08	3.6-5.5	Low-----------	0.10			
	37-80	18-35	1.45-1.70	0.2-2.0	0.10-0.15	3.6-5.5	Low-----------	0.24			
Pelham-----------	0-35	1-8	1.50-1.70	6.0-20	0.04-0.07	3.6-5.5	Low-----------	0.10	5	1	1-2
	35-45	15-30	1.30-1.60	0.6-2.0	0.10-0.13	3.6-5.5	Low-----------	0.24			
	45-80	15-40	1.30-1.60	0.2-2.0	0.10-0.16	3.6-5.5	Low-----------	0.24			

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
34----------------Ortega	0-6	1-3	1.20-1.45	6.0-20	0.05-0.08	3.6-6.5	Low-----------	0.10	5	1	1-2
	6-80	1-3	1.35-1.60	6.0-20	0.03-0.06	3.6-6.5	Low-----------	0.10			
35----------------Ousley	0-10	1-3	1.35-1.45	6.0-20	0.05-0.10	4.5-6.0	Low-----------	0.10	5	1	<.5
	10-80	1-2	1.45-1.60	6.0-20	0.02-0.06	4.5-6.0	Low-----------	0.15			
36*:											
Pantego-----------	0-5	---	0.15-0.35	6.0-20	0.30-0.50	3.6-5.5	Low-----------	0.10	5	8	25-80
	5-8	5-15	1.20-1.40	0.6-2.0	0.20-0.30	3.6-5.5	Low-----------	0.10	5	8	10-15
	8-26	18-35	1.30-1.50	0.6-2.0	0.12-0.20	3.6-5.5	Low-----------	0.28			
	26-80	20-40	1.30-1.60	0.2-0.6	0.15-0.20	3.6-5.5	Low-----------	0.28			
Pamlico-----------	0-18	---	0.20-0.65	0.6-6.0	0.24-0.40	3.6-4.4	Low-----------	----	---	8	20-80
	18-42	5-10	1.60-1.75	6.0-20	0.02-0.10	3.6-5.5	Low-----------	0.10			
	42-55	15-35	1.65-1.75	0.06-0.2	0.03-0.06	3.6-5.5	Low-----------	0.24			
	55-80	5-10	1.60-1.75	6.0-20	0.02-0.10	3.6-5.5	Low-----------	0.10			
37----------------Pelham	0-26	1-8	1.50-1.70	6.0-20	0.04-0.07	3.6-5.5	Low-----------	0.10	5	1	1-2
	26-33	15-30	1.30-1.60	0.6-2.0	0.10-0.13	3.6-5.5	Low-----------	0.24			
	33-80	15-40	1.30-1.60	0.2-2.0	0.10-0.16	3.6-5.5	Low-----------	0.24			
39----------------Plummer	0-45	1-7	1.35-1.65	2.0-20	0.03-0.08	3.6-5.5	Low-----------	0.10	5	1	1-3
	45-80	15-30	1.50-1.70	0.2-2.0	0.07-0.15	3.6-5.5	Low-----------	0.15			
40----------------Pamlico	0-18	---	0.40-0.65	0.6-6.0	0.24-0.26	3.6-4.4	Low-----------	----	---	8	20-80
	18-42	5-10	1.60-1.75	6.0-20	0.03-0.06	3.6-5.5	Low-----------	0.10			
	42-55	15-35	1.65-1.75	0.06-0.2	0.03-0.06	3.6-5.5	Low-----------	0.24			
	55-80	5-10	1.60-1.75	6.0-20	0.03-0.06	3.6-5.5	Low-----------	0.10			
42----------------Pottsburg	0-4	0-4	1.20-1.45	6.0-20	0.05-0.10	3.6-6.5	Low-----------	0.10	5	1	.5-3
	4-52	0-5	1.30-1.65	6.0-20	0.03-0.08	3.6-6.5	Low-----------	0.10			
	52-80	1-6	1.55-1.70	0.6-2.0	0.10-0.25	3.6-6.0	Low-----------	0.15			
43----------------Pottsburg	0-8	1-4	1.20-1.45	6.0-20	0.05-0.15	3.6-6.5	Low-----------	0.10	5	1	.5-3
	8-53	0-4	1.40-1.70	6.0-20	0.03-0.10	3.6-6.5	Low-----------	0.10			
	53-80	1-6	1.55-1.70	0.6-2.0	0.10-0.25	3.6-6.0	Low-----------	0.15			
44----------------Rains	0-15	2-10	1.40-1.70	6.0-20	0.07-0.10	3.6-6.5	Low-----------	0.15	5	2	1-6
	15-20	18-35	1.30-1.60	0.6-2.0	0.11-0.15	3.6-5.5	Low-----------	0.24			
	20-60	18-40	1.30-1.50	0.2-0.6	0.10-0.15	3.6-5.5	Low-----------	0.28			
46----------------Osier	0-6	1-10	1.35-1.60	6.0-20	0.03-0.10	3.6-6.0	Low-----------	0.10	5	1	2-5
	6-80	1-10	1.40-1.60	6.0-20	0.03-0.10	3.6-6.0	Low-----------	0.10			
47----------------Sapelo	0-18	2-5	1.40-1.65	6.0-20	0.03-0.07	3.6-5.5	Low-----------	0.10	5	1	1-3
	18-26	3-7	1.35-1.60	0.6-2.0	0.10-0.15	3.6-5.5	Low-----------	0.15			
	26-48	3-6	1.50-1.70	6.0-20	0.03-0.07	3.6-5.5	Low-----------	0.17			
	48-80	10-30	1.55-1.75	0.2-2.0	0.12-0.17	3.6-5.5	Low-----------	0.24			
51----------------Leon	0-5	1-5	1.30-1.45	6.0-20	0.05-0.15	3.6-5.5	Low-----------	0.10	5	1	.5-4
	5-25	<3	1.30-1.65	6.0-20	0.05-0.10	3.6-5.5	Low-----------	0.10			
	25-40	2-8	1.35-1.70	0.6-6.0	0.15-0.30	3.6-5.5	Low-----------	0.15			
	40-80	1-4	1.50-1.65	0.6-20	0.05-0.10	3.6-5.5	Low-----------	0.10			
52*:											
Mascotte----------	0-6	---	1.00-1.15	2.0-6.0	0.20-0.40	3.6-5.5	Low-----------	0.10	5	8	35-60
	6-22	0-5	1.35-1.55	6.0-20	0.03-0.10	3.6-5.5	Low-----------	0.10			
	22-38	2-10	1.35-1.50	2.0-6.0	0.15-0.25	3.6-5.5	Low-----------	0.15			
	38-80	14-35	1.55-1.79	0.2-0.6	0.10-0.18	3.6-5.5	Low-----------	0.24			

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
52*:											
Pamlico---------	0-25	---	0.20-0.65	0.6-6.0	0.24-0.40	3.6-5.5	Low----------	----	---	8	20-80
	25-50	5-10	1.60-1.75	6.0-20	0.02-0.10	3.6-5.5	Low----------	0.10			
	50-80	15-35	1.65-1.75	0.06-0.2	0.03-0.06	3.6-5.5	Low----------	0.24			
53--------------- Mascotte	0-9	0-5	1.20-1.50	6.0-20	0.05-0.15	3.6-5.5	Low----------	0.10	5	1	3-8
	9-16	0-5	1.35-1.55	6.0-20	0.03-0.10	3.6-5.5	Low----------	0.10			
	16-29	3-10	1.35-1.50	2.0-6.0	0.15-0.25	3.6-5.5	Low----------	0.15			
	29-36	1-8	1.45-1.70	6.0-20	0.05-0.10	3.6-5.5	Low----------	0.10			
	36-80	14-35	1.55-1.79	0.2-0.6	0.10-0.18	3.6-5.5	Low----------	0.24			
54--------------- Albany	0-59	1-10	1.40-1.55	6.0-20	0.02-0.04	3.6-6.5	Low----------	0.10	5	1	1-2
	59-65	1-20	1.50-1.70	2.0-6.0	0.08-0.10	4.5-6.0	Low----------	0.20			
	65-80	13-35	1.55-1.65	0.2-2.0	0.10-0.16	4.5-6.0	Low----------	0.24			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Ini-tial	Total	Uncoated steel	Concrete
					Ft			In	In		
3*. Pits											
6----------------- Blanton	B	None--------	---	---	2.5-4.0	Perched	Mar-Aug	---	---	High-----	High.
7*:											
Troup------------	A	None--------	---	---	>6.0	---	---	---	---	Low------	Moderate.
Bonneau----------	A	None--------	---	---	4.0-5.0	Apparent	Mar-Aug	---	---	Low------	High.
Penney-----------	A	None--------	---	---	>6.0	---	---	---	---	Low------	High.
8----------------- Blanton	A	None--------	---	---	4.0-6.0	Perched	Mar-Aug	---	---	High-----	High.
11---------------- Boulogne	B/D	None--------	---	---	0.5-1.5	Apparent	Mar-Sep	---	---	High-----	High.
16---------------- Dasher	D	Rare--------	---	---	+2-0	Apparent	Jan-Dec	16-20	36-60	High-----	High.
17---------------- Dorovan	D	Frequent----	Very long	Jan-Dec	+1-0.5	Apparent	Jan-Dec	6-12	51-80	High-----	High.
18*:											
Surrency---------	D	Frequent----	Brief or long.	Dec-Mar	0-0.5	Apparent	Jan-Dec	---	---	High-----	High.
Mulat------------	D	Frequent----	Brief or long.	Dec-Jun	0-0.5	Apparent	Jan-Dec	---	---	High-----	High.
20---------------- Duplin	C	None--------	---	---	2.0-3.0	Apparent	Mar-Aug	---	---	High-----	High.
21*:											
Hurricane--------	C	None--------	---	---	2.0-3.5	Apparent	Mar-Aug	---	---	Low------	Moderate.
Ridgewood--------	C	None--------	---	---	2.0-3.5	Apparent	Mar-Aug	---	---	Low------	High.
22---------------- Leefield	C	None--------	---	---	1.5-2.5	Apparent	Mar-Aug	---	---	Moderate	High.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Subsidence: Initial	Subsidence: Total	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In	In		
23----------------- Leon	B/D	None--------	---	---	0.5-1.5	Apparent	Mar-Sep	---	---	High-----	High.
24*:											
Leon--------------	D	None--------	---	---	+2-0	Apparent	Jan-Sep	1-2	2-3	High-----	High.
Evergreen---------	D	None--------	---	---	+2-0	Apparent	Jan-Dec	2-6	8-11	High-----	High.
25----------------- Kershaw	A	None--------	---	---	>6.0	---	---	---	---	Low------	High.
26*:											
Kingsferry--------	B/D	None--------	---	---	0-0.5	Apparent	Feb-Sep	---	---	High-----	High.
Allanton----------	B/D	None--------	---	---	0-0.5	Apparent	Feb-Sep	---	---	High-----	High.
28----------------- Mandarin	C	None--------	---	---	1.5-3.5	Apparent	Mar-Aug	---	---	Moderate	High.
29----------------- Mascotte	B/D	None--------	---	---	0.5-1.5	Apparent	Mar-Sep	---	---	High-----	High.
30----------------- Murville	B/D	None--------	---	---	0-0.5	Apparent	Feb-Sep	---	---	High-----	Moderate.
32----------------- Ocilla	C	None--------	---	---	1.0-2.5	Apparent	Mar-Aug	---	---	High-----	Moderate.
33*:											
Olustee-----------	B/D	None--------	---	---	0.5-1.5	Apparent	Mar-Sep	---	---	High-----	High.
Pelham------------	B/D	None--------	---	---	0-1.0	Apparent	Mar-Sep	---	---	High-----	High.
34----------------- Ortega	A	None--------	---	---	3.5-5.0	Apparent	Mar-Aug	---	---	Low------	High.
35----------------- Ousley	C	Occasional	Brief-----	Dec-Apr	1.5-3.0	Apparent	Mar-Aug	---	---	Low------	High.
36*:											
Pantego-----------	B/D	None--------	---	---	+2-0	Apparent	Jan-Dec	---	---	High-----	High.
Pamlico-----------	D	Rare--------	---	---	+2-0	Apparent	Jan-Dec	4-20	10-36	High-----	High.
37----------------- Pelham	B/D	None--------	---	---	0-1.0	Apparent	Mar-Sep	---	---	High-----	High.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Ini-tial	Total	Uncoated steel	Concrete
					Ft			In	In		
39 Plummer	B/D	None	---	---	0-1.0	Apparent	Mar-Sep	---	---	Moderate	High.
40 Pamlico	D	Rare	---	---	+2-0	Apparent	Jan-Dec	4-12	10-25	High	High.
42 Pottsburg	C	None	---	---	1.0-2.0	Apparent	Mar-Aug	---	---	High	High.
43 Pottsburg	B/D	None	---	---	0.5-1.0	Apparent	Mar-Sep	---	---	High	High.
44 Rains	B/D	None	---	---	0-0.5	Apparent	Mar-Sep	---	---	High	High.
46 Osier	B/D	Frequent	Brief	Dec-Apr	0-0.5	Apparent	Mar-Sep	---	---	High	High.
47 Sapelo	D	None	---	---	0.5-1.5	Apparent	Mar-Sep	---	---	High	High.
51 Leon	D	Occasional	Brief or long.	Mar-Sep	0.5-1.5	Apparent	Mar-Sep	---	---	High	High.
52*:											
Mascotte	D	None	---	---	+1-0	Apparent	Jan-Sep	---	---	High	High.
Pamlico	D	None	---	---	+1-0	Apparent	Jan-Dec	4-20	10-36	High	High.
53 Mascotte	D	None	---	---	0-0.5	Apparent	Feb-Sep	---	---	High	High.
54 Albany	C	None	---	---	1.0-2.5	Apparent	Mar-Aug	---	---	High	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL ANALYSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2.0-1.0 mm)	Sand: Coarse (1-0.5 mm)	Sand: Medium (0.5-0.25 mm)	Sand: Fine (0.25-0.1 mm)	Sand: Very fine (0.1-0.05 mm)	Sand: 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	Water content: 1/3 bar	Water content: 15 bar
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm^3	----Pct (wt)----		
Albany fine sand:															
S88FL-003-10-1	0-8	Ap	0.0	0.9	15.5	64.9	12.9	94.2	3.6	2.2	15.1	1.58	6.1	3.7	1.0
-2	8-18	E1	0.0	0.8	15.6	63.9	12.6	92.9	4.4	2.7	14.0	1.62	5.5	3.0	0.9
-3	18-34	E2	0.0	0.8	16.1	64.0	12.0	92.9	4.3	2.8	35.5	1.52	4.5	2.5	1.1
-4	34-40	E3	0.0	0.9	12.8	62.5	6.6	82.8	8.5	8.7	19.4	1.57	7.7	5.2	2.7
-5	40-59	EB	0.0	0.8	13.7	59.8	12.5	86.8	3.6	9.6	23.3	1.50	9.4	6.4	3.5
-6	59-65	Btg1	0.0	1.1	14.4	51.4	12.5	79.4	1.4	19.2	0.9	1.70	13.4	9.5	5.8
-7	65-80	Btg2	0.0	1.0	14.2	43.2	14.6	73.0	3.3	23.7	1.7	1.69	16.4	13.5	8.4
Blanton fine sand:															
S88FL-003-9-1	0-8	Ap	0.0	0.8	16.0	64.9	12.4	94.1	3.8	2.1	22.4	1.58	5.8	3.5	0.9
-2	8-21	E1	0.0	0.8	16.8	64.3	11.4	93.3	4.3	2.4	28.9	1.56	4.5	2.6	0.8
-3	21-40	E2	0.0	1.0	17.1	63.3	11.5	92.9	4.3	2.8	31.9	1.51	4.5	2.6	1.0
-4	40-55	E3	0.0	0.8	15.3	62.6	11.6	90.3	4.5	5.2	27.6	1.54	5.4	3.4	1.5
-5	55-73	E4	0.0	0.8	15.0	62.6	11.6	90.0	3.8	6.2	14.5	1.66	6.8	3.8	1.8
-6	73-80	Btg	0.0	0.8	13.1	50.1	10.8	74.8	3.0	22.2	0.3	1.76	14.1	11.1	6.2
Boulogne sand:															
S89FL-003-21-1	0-6	Ap	0.0	7.0	42.2	42.4	3.0	94.6	4.1	1.3	32.2	1.48	9.2	6.0	1.7
-2	6-11	Bh	0.1	5.3	36.2	47.3	4.1	93.0	5.6	1.4	21.4	1.60	8.7	5.1	1.2
-3	11-17	E1	0.0	5.4	33.3	50.0	5.1	93.8	4.6	1.6	23.3	1.58	6.7	4.2	1.0
-4	17-30	E2	0.1	6.6	36.2	48.3	4.3	95.5	2.7	1.8	28.3	1.60	4.7	2.8	1.0
-5	30-38	E3	0.1	5.8	33.2	52.8	4.8	96.7	1.9	1.4	31.2	1.54	3.5	1.9	0.4
-6	38-44	E4	0.0	3.0	31.0	50.8	4.6	92.7	4.2	3.1	14.5	1.73	4.9	3.2	0.5
-7	44-49	BE	0.0	5.7	28.9	53.6	3.5	91.7	4.2	4.1	1.8	1.75	6.5	4.9	1.3
-8	49-59	B'h	0.0	4.4	21.2	67.4	3.9	96.9	2.0	1.1	5.6	1.66	7.1	4.2	0.9
-9	59-66	E'	0.0	3.3	19.0	72.7	3.6	98.6	0.4	1.0	57.9	1.50	2.7	1.1	0.1
-10	66-80	B''h	0.0	1.7	11.1	77.3	4.6	94.7	4.1	1.2	4.5	1.64	10.7	5.7	1.3
Duplin loamy fine sand:															
S88FL-003-7-1	0-4	Ap	0.1	1.0	10.3	55.7	17.9	85.0	7.3	7.7	2.4	1.56	16.9	10.2	3.5
-2	4-10	E	0.1	1.2	11.0	56.6	17.2	86.1	10.3	3.6	7.0	1.61	10.1	5.6	1.9
-3	10-15	Bt1	0.0	0.8	6.8	35.2	13.8	56.6	18.1	25.3	2.5	1.59	21.6	17.1	12.4
-4	15-27	Bt2	0.0	0.2	2.8	12.0	7.2	22.2	22.8	55.0	0.4	1.43	27.4	23.4	17.2
-5	27-44	Btg1	0.0	0.2	2.0	42.2	5.6	50.0	9.3	40.7	0.7	1.59	24.4	20.7	13.8
-6	44-70	Btg2	0.0	0.8	6.0	37.2	6.4	50.4	8.6	41.0	1.3	1.44	31.0	27.6	17.5

TABLE 16.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2.0-1.0 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
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm^3	Pct (wt)	Pct (wt)	Pct (wt)
Hurricane fine sand:															
S89FL-003-18-1	0-3	A1	0.0	5.9	55.9	29.2	4.5	95.5	3.2	1.3	25.6	1.38	10.0	6.8	2.5
-2	3-8	A2	0.0	8.3	59.4	24.2	2.9	94.8	3.4	1.8	42.1	1.65	4.6	3.2	0.7
-3	8-16	E1	0.0	7.4	55.6	28.1	4.4	95.5	2.5	2.0	35.5	1.65	3.6	2.2	0.6
-4	16-24	E2	0.0	5.6	56.1	30.5	3.4	95.6	2.3	2.1	64.4	1.59	3.5	2.0	0.6
-5	24-35	E3	0.0	5.4	52.4	33.1	4.8	95.7	2.5	1.8	94.0	1.58	3.1	1.9	0.5
-6	35-63	E4	0.0	6.6	56.2	30.9	2.8	96.5	2.3	1.2	73.0	1.58	3.1	1.6	0.2
-7	63-74	BE	0.0	8.3	55.2	28.2	3.1	94.8	2.8	2.4	25.3	1.70	4.4	2.8	0.8
-8	74-80	Bh	0.0	7.2	55.3	31.4	3.6	97.5	1.3	1.2	59.2	1.70	3.3	1.9	0.2
Kingsferry fine sand:															
S89FL-003-14-1	0-7	A1	0.0	4.1	30.9	50.8	8.8	94.6	4.3	1.1	16.1	1.48	16.5	11.9	2.6
-2	7-25	A2	0.1	4.3	29.5	50.1	9.1	93.1	5.4	1.5	9.0	1.67	7.4	4.1	0.9
-3	25-34	A3	0.0	4.4	29.3	51.6	9.2	94.5	3.2	2.3	8.4	1.77	5.8	3.5	0.7
-4	34-43	Bh1	0.1	4.5	30.1	49.8	7.8	92.3	3.9	3.8	35.1	1.79	7.4	5.1	1.0
-5	43-54	Bh2	0.1	4.5	27.4	50.6	8.1	90.7	4.6	4.7	23.4	1.71	12.6	9.5	3.0
-6	54-80	Bh3	0.0	3.1	19.3	60.8	9.4	92.6	4.5	2.9	4.4	1.55	19.3	13.7	3.7
Leefield fine sand:															
S88FL-003-5-1	0-10	Ap	0.0	0.2	2.5	63.1	23.2	89.0	7.4	3.6	20.1	1.35	14.0	8.6	2.1
-2	10-22	E1	0.0	0.2	2.3	63.2	24.4	90.1	6.5	3.4	6.4	1.69	8.3	3.7	1.0
-3	22-28	E2	0.0	0.2	2.3	60.4	22.5	85.4	5.6	9.0	1.7	1.71	11.4	6.7	3.0
-4	28-35	Btv	0.0	0.2	2.2	50.2	20.4	73.0	7.9	19.1	1.1	1.74	16.0	11.8	7.1
-5	35-58	Btg1	0.0	0.2	0.2	45.2	20.0	65.6	9.6	24.8	0.2	1.71	19.4	16.6	11.0
-6	58-80	Btg2	0.0	0.0	1.0	41.6	22.0	64.6	6.1	29.3	0.3	1.74	20.4	16.4	10.5
Leon sand:															
S80FL-003-2-1	0-7	A1	0.0	7.4	60.6	24.8	2.6	95.4	4.4	0.2	39.4	1.43	8.9	5.7	2.4
-2	7-21	A2	0.0	5.8	55.3	29.7	4.1	94.9	4.7	0.4	27.9	1.56	4.3	2.6	0.7
-3	21-24	Bh1	0.0	7.0	56.6	25.4	2.9	91.9	5.3	2.8	7.2	1.39	20.0	15.3	5.8
-4	24-26	Bh2	0.0	6.7	56.6	27.3	3.0	93.6	4.1	2.3	36.8	1.44	8.5	6.6	3.0
-5	26-38	BC	0.0	6.3	56.1	29.3	3.4	95.1	2.9	2.0	24.0	1.63	5.7	3.5	1.6
-6	38-47	E	0.0	6.8	55.6	28.0	2.6	93.0	3.9	3.1	2.7	1.76	9.2	6.3	2.9
-7	47-55	B'h1	0.0	10.2	61.8	21.0	1.2	94.2	4.5	1.3	---	---	---	---	---
-8	55-80	B'h2	0.0	11.5	67.3	17.3	0.4	96.5	2.6	0.9	---	---	---	---	---

TABLE 16.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2.0-1.00 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
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm^3	----Pct (wt)----		
Mascotte fine sand:															
S89FL-003-16-1	0-6	A	0.0	7.0	50.3	29.0	4.1	90.4	8.0	1.6	26.6	1.29	12.1	7.8	3.1
-2	6-18	E	0.3	0.6	2.8	77.8	10.0	91.5	7.2	1.3	16.1	1.51	5.4	2.6	0.4
-3	18-20	Bh1	0.0	0.4	2.5	72.6	12.6	88.1	8.6	3.3	10.5	1.42	16.8	10.9	2.9
-4	20-24	Bh2	0.0	0.3	2.0	74.6	13.3	90.2	6.0	3.8	24.8	1.26	18.7	11.5	3.5
-5	24-29	BE	0.0	0.3	2.3	77.3	13.8	93.2	4.8	2.0	28.9	1.40	6.8	3.7	0.8
-6	29-38	E'	0.0	0.3	2.2	79.1	14.5	96.1	2.5	1.4	28.3	1.46	4.8	2.0	0.2
-7	38-52	Btg1	0.0	0.3	1.9	61.6	9.7	73.5	9.0	17.5	0.5	1.73	14.9	11.9	5.9
-8	52-56	Btg2	0.0	0.4	2.0	73.2	8.4	84.0	9.8	6.2	1.5	1.56	18.4	12.4	3.4
-9	56-80	Cg	0.0	0.4	1.8	79.6	8.2	90.0	9.0	1.0	3.4	1.41	18.9	14.3	3.2
Ocilla fine sand:															
S88FL-003-6-1	0-9	Ap	0.0	0.2	3.2	64.9	22.0	90.3	6.1	3.6	8.9	1.50	11.6	7.4	1.7
-2	9-22	E	0.0	0.2	3.2	66.6	21.5	91.5	5.6	2.9	11.2	1.62	8.6	4.1	1.2
-3	22-26	BE	0.0	0.2	3.0	62.2	22.0	87.4	6.4	6.2	6.9	1.68	10.7	5.8	2.4
-4	26-32	Btg1	0.0	0.2	2.8	52.9	17.2	73.1	8.9	18.0	0.7	1.74	16.8	13.0	7.5
-5	32-41	Btg2	0.0	0.2	2.4	49.2	17.5	69.3	7.8	22.9	0.5	1.71	16.8	13.8	9.2
-6	41-58	Btg3	0.0	0.2	2.2	46.0	15.8	64.2	6.1	29.7	0.1	1.70	20.7	17.8	11.5
-7	58-80	Btg4	0.0	0.2	2.0	51.8	18.4	72.4	6.3	21.3	0.2	1.84	15.4	12.8	7.3
Olustee fine sand:															
S88FL-003-3-1	0-8	A	0.0	0.1	1.9	72.0	18.8	92.8	5.6	1.6	20.7	1.37	24.5	7.6	2.1
-2	8-14	Bh	0.0	0.2	2.2	62.6	27.8	92.8	5.6	1.6	11.6	1.51	11.5	5.2	0.8
-3	14-27	E1	0.0	0.2	2.1	62.3	28.3	92.9	6.0	1.1	8.9	1.63	11.0	4.5	0.6
-4	27-37	E2	0.0	0.2	2.1	63.8	29.0	95.1	4.4	0.5	11.2	1.68	9.2	2.2	0.2
-5	37-57	Btg1	0.0	0.1	1.7	47.4	23.8	73.0	7.8	19.2	0.3	1.75	17.0	13.2	7.2
-6	57-80	Btg2	0.0	0.0	1.4	41.0	22.2	64.6	6.5	28.9	0.2	1.75	18.9	15.8	10.2
Ortega sand:															
S89FL-003-19-1	0-3	A1	0.0	6.0	51.9	35.1	3.6	96.6	2.3	1.1	24.3	1.06	14.9	9.8	6.2
-2	3-6	A2	0.0	5.8	50.0	36.3	4.1	96.2	2.4	1.4	51.9	1.54	6.5	3.0	0.8
-3	6-41	C1	0.0	6.4	53.1	33.6	3.3	96.4	2.0	1.6	95.3	1.51	2.6	1.6	0.4
-4	41-55	C2	0.0	5.1	46.3	41.2	4.6	97.2	1.5	1.3	77.6	1.57	2.5	1.4	0.2
-5	55-67	C3	0.0	4.0	44.6	42.1	5.9	96.6	2.8	0.6	98.6	1.50	2.3	1.2	0.2
-6	67-80	C4	0.1	6.5	51.0	36.8	3.4	97.8	1.5	0.7	80.2	1.54	2.7	1.6	0.2

TABLE 16.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2.0-1.0 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
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm^3	----Pct (wt)----		
Pantego muck:															
S89FL-003-22-1	0-5	Oa	---	---	---	---	---	---	---	---	26.3	0.84	55.1	45.0	12.6
-2	5-8	A1	0.0	0.0	1.2	28.0	24.3	53.4	26.9	19.7	97.3	0.57	75.5	61.8	16.8
-3	8-21	A2	0.0	0.0	1.3	32.9	22.5	56.7	26.8	16.5	52.6	1.00	50.3	39.5	10.0
-4	21-26	A3	0.0	0.0	1.6	37.8	22.8	62.2	25.8	12.0	1.1	1.80	15.1	12.1	2.7
-5	26-40	Btg1	0.0	0.0	1.0	31.4	19.0	51.4	14.5	34.1	0.2	1.60	21.8	18.2	11.3
-6	40-80	Btg2	0.0	0.0	1.2	35.4	17.0	53.6	12.6	33.8	0.5	1.70	19.3	16.5	10.9
Pottsburg sand:															
S89FL-003-20-1	0-4	Ap	0.0	5.8	40.6	42.2	4.7	93.3	5.3	1.4	11.5	1.13	19.7	13.6	4.9
-2	4-8	A	0.0	6.0	39.6	42.7	5.5	93.8	5.1	1.1	43.4	1.59	6.9	4.2	1.0
-3	8-21	E1	0.0	6.5	40.8	41.8	5.3	94.4	4.5	1.1	32.9	1.60	5.9	3.3	0.7
-4	21-36	E1	0.1	7.8	42.2	37.6	4.1	91.8	6.6	1.6	11.4	1.66	7.8	5.5	0.9
-5	36-46	E2	0.1	7.7	41.6	38.5	4.5	92.4	4.0	3.6	24.7	1.74	4.6	3.1	1.1
-6	46-53	EB	0.1	8.6	45.3	37.7	3.2	94.9	3.2	1.9	6.4	1.75	6.5	4.9	0.9
-7	53-80	Bh	0.1	5.6	38.9	49.1	2.6	96.3	2.7	1.0	2.8	1.68	7.2	5.0	0.6
Ridgewood fine sand:															
S89FL-003-13-1	0-4	Ap	0.0	4.1	32.7	54.5	3.2	94.5	4.5	1.0	33.5	1.44	8.6	6.2	2.0
-2	4-12	C1	0.0	4.7	34.4	53.1	3.9	96.1	3.0	0.9	20.7	1.68	5.0	3.3	0.7
-3	12-24	C2	0.0	3.9	30.2	56.9	5.0	96.0	2.9	1.1	36.8	1.66	3.9	2.3	0.5
-4	24-35	C3	0.0	4.2	32.5	55.2	4.1	96.0	2.9	1.1	44.7	1.58	3.4	1.9	0.5
-5	35-45	C4	0.1	4.2	29.3	58.2	4.8	96.6	2.5	0.9	53.9	1.55	8.1	6.7	0.4
-6	45-60	Cg1	0.0	4.9	30.1	57.5	4.4	96.9	2.5	0.6	40.8	1.59	2.4	1.3	0.2
-7	60-76	Cg2	0.1	5.0	24.5	62.4	4.2	96.2	2.3	1.5	21.0	1.68	6.7	4.4	1.7
-8	76-80	Cg3	0.0	1.9	12.6	78.4	4.5	97.4	2.4	0.2	27.0	1.60	4.1	1.6	0.2
Sapelo fine sand:															
S89FL-003-17-1	0-6	A	0.0	0.1	8.4	73.2	14.5	96.2	3.2	0.6	27.4	1.36	9.8	6.8	1.6
-2	6-18	E	0.0	0.1	7.9	72.2	15.6	95.8	1.8	2.4	21.0	1.50	6.6	3.5	0.4
-3	18-22	Bh1	0.0	0.1	7.2	69.3	14.8	91.4	4.6	4.0	13.8	1.46	12.2	7.1	1.6
-4	22-26	Bh2	0.0	0.2	7.8	68.1	14.1	90.2	3.6	6.2	61.8	1.35	11.5	7.1	2.3
-5	26-31	BE	0.0	0.1	6.8	71.3	16.5	94.7	2.1	3.2	19.4	1.50	6.6	3.5	0.8
-6	31-48	E′	0.0	0.1	7.9	72.2	15.7	95.9	1.5	2.6	16.8	1.60	5.4	2.1	0.2
-7	48-55	Btg1	0.0	0.2	7.4	60.6	12.0	80.2	4.4	15.4	0.4	1.71	16.9	13.8	6.1
-8	55-70	Btg2	0.1	0.2	3.7	29.3	4.0	74.6	2.2	23.2	0.6	1.69	17.7	14.8	6.5
-9	70-80	Cg	0.0	0.1	2.2	33.4	5.4	82.2	1.2	16.6	0.4	1.66	17.9	13.1	5.3

TABLE 16.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2.0-1.0 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
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm^3	----Pct (wt)----		
Troup fine sand:															
S89FL-003-8-1	0-8	A	0.0	0.8	9.8	66.6	14.4	91.6	6.5	1.9	22.4	1.53	8.4	4.4	1.1
-2	8-17	E1	0.0	0.7	9.2	64.6	17.5	92.0	5.8	2.2	19.7	1.61	6.2	3.3	0.9
-3	17-31	E2	0.0	0.7	10.6	65.5	15.4	92.2	5.0	2.8	26.3	1.56	5.4	2.8	0.9
-4	31-49	E3	0.0	0.8	9.3	66.6	16.2	92.9	5.1	2.0	29.3	1.47	5.0	2.4	0.6
-5	49-55	Bt1	0.0	0.7	7.8	55.0	13.6	77.1	5.2	17.7	0.9	1.61	15.6	12.6	6.7
-6	55-74	Bt2	0.0	0.6	8.2	52.0	11.0	71.8	3.6	24.6	0.3	1.70	17.2	13.8	7.7
-7	74-80	Bt3	0.0	0.5	8.5	60.0	8.8	77.8	2.4	19.8	1.1	1.67	14.4	11.2	6.2

TABLE 17.--CHEMICAL ANALYSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: Na	Extractable bases: K	Extractable bases: Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH: H_2O (1:1)	pH: $CaCl_2$ 0.01M (1:2)	pH: KCl 1N (1:1)	Pyrophosphate extractable: C	Pyrophosphate extractable: Fe	Pyrophosphate extractable: Al	Citrate-dithionite extractable: Fe	Citrate-dithionite extractable: Al
	In		Milliequivalents/100 grams of soil							Pct	Pct	mmhos/cm				Pct	Pct	Pct	Pct	Pct
Albany fine sand:																				
S88FL-003-10-1	0-8	Ap	1.67	0.14	0.02	0.08	1.91	1.22	3.13	61	0.61	0.04	5.8	5.3	5.3	---	---	---	---	---
-2	8-18	E1	0.38	0.08	0.01	0.02	0.49	0.00	0.49	100	0.16	0.02	5.6	5.0	4.8	---	---	---	---	---
-3	18-34	E2	0.21	0.07	0.01	0.03	0.32	0.00	0.32	100	0.09	0.03	5.3	4.7	4.6	---	---	---	---	---
-4	34-40	E3	0.40	0.09	0.01	0.06	0.56	0.39	0.95	59	0.08	0.04	4.9	4.4	4.4	---	---	---	---	---
-5	40-59	EB	0.32	0.05	0.01	0.05	0.43	1.47	1.90	23	0.06	0.04	4.8	4.4	4.4	---	---	---	---	---
-6	59-65	Btg1	1.02	0.11	0.01	0.09	1.23	1.81	3.04	40	0.06	0.04	4.7	4.3	4.2	---	---	---	0.11	0.01
-7	65-90	Btg2	1.27	0.18	0.02	0.10	1.57	2.78	4.35	36	0.07	0.04	5.1	4.2	4.1	---	---	---	0.13	0.02
Blanton fine sand:																				
S88FL-003-9-1	0-8	Ap	1.05	0.11	0.01	0.04	1.21	0.71	1.92	63	0.14	0.02	5.8	5.0	5.1	---	---	---	---	---
-2	8-21	E1	0.24	0.08	0.02	0.04	0.38	0.32	0.70	54	0.10	0.01	5.6	4.7	4.6	---	---	---	---	---
-3	21-40	E2	0.16	0.05	0.01	0.02	0.24	0.00	0.24	100	0.08	0.02	5.1	4.5	4.5	---	---	---	---	---
-4	40-55	E3	0.34	0.08	0.02	0.06	0.50	0.26	0.76	66	0.05	0.03	5.0	4.4	4.5	---	---	---	0.12	0.02
-5	55-73	E4	0.70	0.10	0.02	0.04	0.86	1.61	2.47	35	0.05	0.03	5.2	4.8	4.7	---	---	---	0.15	0.02
-6	73-80	Btg	1.20	1.11	0.03	0.08	2.42	4.17	6.59	37	0.02	0.04	4.8	4.3	4.2	---	---	---	0.19	0.03
Boulogne sand:																				
S89FL-003-21-1	0-6	Ap	0.19	0.07	0.00	0.02	0.28	7.48	7.76	4	0.99	0.04	4.7	3.8	3.3	---	---	---	---	---
-2	6-11	Bh	0.04	0.02	0.00	0.01	0.07	5.95	6.02	1	0.83	0.03	5.4	4.4	4.2	0.36	0.02	0.10	0.04	0.07
-3	11-17	E1	0.02	0.01	0.00	0.00	0.03	3.15	3.18	1	0.40	0.03	5.5	4.9	4.6	---	---	---	---	---
-4	17-30	E2	0.03	0.03	0.00	0.01	0.07	1.60	1.67	4	0.18	0.02	5.6	5.0	4.7	---	---	---	---	---
-5	30-38	E3	0.02	0.01	0.00	0.00	0.03	0.83	0.86	3	0.11	0.02	5.7	5.1	4.7	---	---	---	---	---
-6	38-44	E4	0.01	0.01	0.00	0.00	0.02	1.62	1.64	1	0.15	0.02	5.5	5.0	4.6	---	---	---	---	---
-7	44-49	BE	0.01	0.01	0.00	0.00	0.02	3.34	3.36	1	0.28	0.02	5.4	4.9	4.6	---	---	---	---	---
-8	49-59	B'h	0.01	0.01	0.00	0.00	0.02	3.55	3.57	1	0.54	0.02	5.3	4.9	4.5	0.29	0.02	0.14	0.04	0.09
-9	59-66	E'	0.01	0.01	0.00	0.00	0.02	0.78	0.80	3	0.12	0.02	6.1	5.1	4.7	---	---	---	---	---
-10	66-80	B''h	0.01	0.01	0.00	0.00	0.02	7.27	7.29	0	0.82	0.03	5.1	4.7	4.5	0.56	0.01	0.18	0.02	0.14
Duplin loamy fine sand:																				
S88FL-003-7-1	0-4	Ap	4.20	1.52	0.06	0.25	6.03	6.22	12.25	49	2.28	0.12	5.4	5.1	5.2	---	---	---	---	---
-2	4-10	E	1.55	0.41	0.03	0.16	2.15	2.36	4.51	48	0.77	0.06	6.0	5.2	5.4	---	---	---	---	---
-3	10-15	Bt1	2.80	0.78	0.06	0.64	4.28	4.60	8.88	48	0.51	0.06	5.9	5.3	5.2	---	---	---	2.61	0.25
-4	15-27	Bt2	4.40	1.48	0.09	0.43	6.40	9.10	15.50	41	0.15	0.07	4.9	4.3	4.3	---	---	---	4.00	0.28
-5	27-44	Btg1	0.97	1.40	0.06	0.12	2.55	5.38	7.93	32	0.06	0.06	4.8	4.3	4.2	---	---	---	2.46	0.22
-6	44-70	Btg2	0.62	1.60	0.07	0.12	2.41	7.41	9.82	25	0.04	0.04	4.8	4.2	4.2	---	---	---	5.80	0.25

TABLE 17.--CHEMICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: Na	Extractable bases: K	Extractable bases: Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH: H_2O (1:1)	pH: $CaCl_2$ 0.01M (1:2)	pH: KCl 1N (1:1)	Pyrophosphate extractable: C	Pyrophosphate extractable: Fe	Pyrophosphate extractable: Al	Citrate-dithionite extractable: Fe	Citrate-dithionite extractable: Al
	In		----Milliequivalents/100 grams of soil-----							Pct	Pct	mmhos/cm				Pct	Pct	Pct	Pct	Pct
Hurricane fine sand:																				
S89FL-003-18-1	0-3	A1	0.29	0.09	0.00	0.03	0.41	3.23	3.64	11	0.95	0.05	4.9	4.0	3.6	---	---	---	---	---
-2	3-8	A2	0.07	0.03	0.00	0.01	0.11	1.71	1.82	6	0.64	0.03	5.4	4.5	4.2	---	---	---	---	---
-3	8-16	E1	0.07	0.04	0.00	0.01	0.12	0.65	0.77	16	0.17	0.02	5.9	5.1	4.5	---	---	---	---	---
-4	16-24	E2	0.11	0.04	0.00	0.01	0.16	0.50	0.66	24	0.08	0.02	5.9	5.1	4.5	---	---	---	---	---
-5	24-35	E3	0.07	0.03	0.00	0.01	0.11	0.43	0.54	20	0.10	0.03	5.7	5.0	4.4	---	---	---	---	---
-6	35-63	E4	0.04	0.03	0.00	0.01	0.08	0.32	0.40	20	0.02	0.02	6.0	5.1	4.5	---	---	---	---	---
-7	63-74	BE	0.03	0.01	0.00	0.00	0.04	0.31	0.35	11	0.02	0.02	5.5	4.9	4.5	---	---	---	---	---
-8	74-80	Bh	0.04	0.01	0.00	0.00	0.05	0.43	0.48	10	0.08	0.02	5.7	5.1	4.7	0.01	0.00	0.03	0.05	0.04
Kingsferry fine sand:																				
S89FL-003-14-1	0-7	A1	0.03	0.04	0.01	0.02	0.10	6.78	6.88	1	1.14	0.03	4.2	3.7	3.1	---	---	---	---	---
-2	7-25	A2	0.02	0.03	0.00	0.00	0.05	6.02	6.07	1	0.68	0.01	4.8	4.1	3.5	---	---	---	---	---
-3	25-34	A3	0.03	0.01	0.00	0.00	0.04	2.84	2.88	1	0.21	0.01	5.1	4.4	4.0	---	---	---	---	---
-4	34-43	Bh1	0.02	0.02	0.00	0.00	0.04	4.79	4.83	1	0.41	0.01	5.0	4.4	4.1	0.26	0.00	0.08	0.05	0.06
-5	43-54	Bh2	0.01	0.01	0.00	0.00	0.02	9.74	9.76	0	0.82	0.01	4.9	4.4	4.1	0.44	0.00	0.14	0.03	0.11
-6	54-80	Bh3	0.01	0.01	0.00	0.00	0.02	24.38	24.40	0	2.17	0.01	4.9	4.4	4.1	0.77	0.00	0.40	0.02	0.39
Leefield fine sand:																				
S88FL-003-5-1	0-10	Ap	3.45	0.82	0.04	0.09	4.40	1.63	6.03	73	0.88	0.07	5.9	5.8	5.7	---	---	---	---	---
-2	10-22	E1	0.48	0.12	0.03	0.03	0.66	0.67	1.33	50	0.09	0.03	6.1	5.7	5.6	---	---	---	---	---
-3	22-28	E2	0.85	0.24	0.03	0.12	1.24	1.50	2.74	45	0.08	0.03	6.2	5.5	5.7	---	---	---	---	---
-4	28-35	Btv	1.30	0.49	0.03	0.19	2.01	4.65	6.66	30	0.08	0.06	5.2	4.5	4.5	---	---	---	1.66	0.19
-5	35-58	Btg1	1.47	0.82	0.05	0.11	2.45	5.73	8.18	30	0.04	0.07	4.7	4.3	4.3	---	---	---	2.48	0.26
-6	58-80	Btg2	1.12	0.74	0.06	0.10	2.02	5.06	7.08	29	0.00	0.07	4.6	4.2	4.1	---	---	---	1.25	0.08
Leon sand:																				
S80FL-003-2-1	0-7	A1	0.25	0.11	0.02	0.01	0.39	4.44	4.83	8	0.41	0.03	3.9	3.4	3.0	0.14	0.03	0.01	0.14	0.01
-2	7-21	A2	0.04	0.01	0.01	0.00	0.06	0.99	1.05	6	0.16	0.01	4.4	3.9	3.5	0.00	0.02	0.00	0.02	0.00
-3	21-24	Bh1	0.04	0.01	0.00	0.00	0.05	23.78	23.83	---	2.31	0.03	4.1	4.0	3.9	1.52	0.04	0.43	0.01	0.30
-4	24-26	Bh2	0.03	0.01	0.01	0.00	0.05	12.30	12.35	---	0.80	0.02	4.2	4.4	4.3	0.70	0.04	0.32	0.01	0.19
-5	26-38	BC	0.02	0.01	0.00	0.00	0.03	2.93	2.96	1	0.35	0.01	4.5	4.6	4.5	0.16	0.04	0.17	0.01	0.08
-6	38-47	E	0.02	0.01	0.00	0.00	0.03	3.49	3.52	1	0.19	0.02	4.2	4.7	4.6	0.02	0.04	0.16	0.02	0.09
-7	47-55	B'h1	0.01	0.01	0.00	0.00	0.02	2.76	2.78	1	0.18	0.02	4.3	4.6	4.7	0.12	0.04	0.12	0.03	0.10
-8	55-80	B'h2	0.03	0.01	0.00	0.00	0.04	5.79	5.83	1	0.38	0.02	4.4	4.9	4.7	0.21	0.03	0.14	0.01	0.12

TABLE 17.--CHEMICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: Na	Extractable bases: K	Extractable bases: Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH H_2O (1:1)	pH $CaCl_2$ 0.01M (1:2)	pH KCl 1N (1:1)	Pyrophosphate extractable: C	Pyrophosphate extractable: Fe	Pyrophosphate extractable: Al	Citrate-dithionite extractable: Fe	Citrate-dithionite extractable: Al
	In		Milliequivalents/100 grams of soil							Pct	Pct	mmhos/cm				Pct	Pct	Pct	Pct	Pct
Mascotte fine sand:																				
S89FL-003-16-1	0-6	A	0.70	0.22	0.04	0.06	1.02	9.63	10.65	10	1.49	0.05	4.3	3.5	3.0	---	---	---	---	---
-2	6-18	E	0.06	0.02	0.00	0.00	0.08	1.16	1.24	6	0.18	0.01	5.0	4.2	3.6	---	---	---	---	---
-3	18-20	Bh1	0.12	0.04	0.02	0.02	0.20	13.41	13.61	1	1.86	0.04	4.6	3.9	3.5	0.76	0.01	0.10	0.06	0.10
-4	20-24	Bh2	0.06	0.02	0.00	0.00	0.08	24.16	24.24	0	1.60	0.02	4.8	4.3	3.7	1.21	0.02	0.34	0.05	0.35
-5	24-29	BE	0.03	0.02	0.00	0.00	0.05	3.81	3.86	1	0.12	0.01	5.1	4.7	4.4	---	---	---	---	---
-6	29-38	E′	0.03	0.03	0.00	0.00	0.06	0.29	0.35	17	0.36	0.01	5.2	5.0	4.7	---	---	---	---	---
-7	38-52	Btg1	0.09	0.14	0.00	0.02	0.25	6.17	6.42	4	0.12	0.01	5.1	4.4	4.2	---	---	---	---	---
-8	52-56	Btg2	0.03	0.04	0.00	0.01	0.08	15.75	15.83	1	0.39	0.01	5.2	4.6	4.5	---	---	---	0.52	0.17
-9	56-80	C	0.02	0.01	0.00	0.01	0.04	17.80	17.84	0	0.52	0.01	5.3	4.9	4.8	---	---	---	0.10	0.55
Ocilla fine sand:																				
S88FL-003-6-1	0-9	Ap	1.10	0.14	0.04	0.08	1.36	4.15	5.51	25	0.77	0.04	5.4	5.0	4.8	---	---	---	---	---
-2	9-22	E1	0.16	0.05	0.02	0.02	0.25	1.38	1.63	15	0.14	0.03	5.4	4.9	4.8	---	---	---	---	---
-3	22-26	E2	0.25	0.08	0.03	0.03	0.39	1.89	2.28	17	0.06	0.07	4.7	4.3	4.4	---	---	---	---	---
-4	26-32	Btg1	0.77	0.45	0.06	0.08	1.36	5.75	7.11	19	0.07	0.12	4.5	4.2	4.4	---	---	---	3.88	0.30
-5	32-41	Btg2	0.40	0.49	0.05	0.05	0.99	5.98	6.97	14	0.04	0.09	4.4	4.2	4.3	---	---	---	2.24	0.25
-6	41-58	Btg3	0.11	1.07	0.09	0.02	1.29	7.59	8.88	15	0.02	0.06	4.7	4.0	4.1	---	---	---	1.23	0.15
-7	58-80	Btg4	0.10	0.95	0.11	0.02	1.18	5.00	6.18	19	0.06	0.04	4.9	4.1	4.2	---	---	---	0.25	0.06
Olustee fine sand:																				
S88FL-003-3-1	0-8	Ap	0.19	0.08	0.03	0.04	0.34	5.42	5.76	6	1.16	0.07	4.6	4.0	3.8	---	---	---	---	---
-2	8-14	Bh	0.04	0.02	0.03	0.01	0.12	4.30	4.42	3	0.48	0.05	5.1	4.8	4.7	0.28	0.03	0.13	0.06	0.09
-3	14-27	E1	0.02	0.02	0.03	0.00	0.07	1.60	1.67	4	0.28	0.04	5.1	5.0	5.0	---	---	---	---	---
-4	27-37	E2	0.02	0.02	0.03	0.00	0.07	2.48	2.55	3	0.05	0.04	5.2	5.1	5.2	---	---	---	---	---
-5	37-57	Btg1	0.15	0.29	0.05	0.02	0.51	4.81	5.32	10	0.16	0.05	4.9	4.3	4.4	---	---	---	2.21	0.16
-6	57-80	Btg2	0.18	1.07	0.09	0.01	1.35	4.95	6.30	21	0.12	0.05	4.9	4.3	4.3	---	---	---	1.92	0.12
Ortega sand:																				
S89FL-003-19-1	0-3	A1	0.24	0.11	0.00	0.03	0.38	2.95	3.33	11	0.77	0.04	5.0	3.9	3.5	---	---	---	---	---
-2	3-6	A2	0.07	0.03	0.00	0.01	0.11	1.56	1.67	7	0.33	0.03	5.3	4.4	3.9	---	---	---	---	---
-3	6-41	C1	0.02	0.02	0.00	0.01	0.05	0.31	0.36	18	0.04	0.03	5.6	4.8	4.3	---	---	---	---	---
-4	41-55	C2	0.05	0.02	0.00	0.00	0.07	0.09	0.16	44	0.05	0.03	5.7	5.0	4.4	---	---	---	---	---
-5	55-67	C3	0.02	0.02	0.00	0.00	0.04	0.35	0.39	10	0.04	0.02	6.0	5.0	4.4	---	---	---	---	---
-6	67-80	C4	0.03	0.03	0.00	0.00	0.06	0.20	0.26	23	0.34	0.02	6.1	5.1	4.5	---	---	---	---	---
Pantego muck:																				
S89FL-003-22-1	0-5	Oa	1.42	0.82	0.24	0.29	2.77	49.03	51.80	5	15.01	0.09	4.5	4.0	3.6	---	---	---	---	---
-2	5-8	A1	0.41	0.24	0.10	0.11	0.86	34.99	35.85	2	7.40	0.12	4.4	4.0	3.7	---	---	---	---	---
-3	8-26	A2	0.12	0.11	0.07	0.07	0.37	31.31	31.68	1	5.43	0.07	4.6	4.1	3.8	---	---	---	---	---
-4	26-40	A3	0.09	0.07	0.00	0.01	0.17	9.63	9.80	2	1.12	0.04	4.7	4.1	3.8	---	---	---	---	---
-5	40-45	Btg1	0.21	0.32	0.03	0.04	0.60	11.38	11.98	5	0.28	0.04	4.5	3.7	3.4	---	---	---	0.55	0.12
-6	45-80	Btg2	0.22	0.49	0.03	0.04	0.78	11.22	12.00	7	0.15	0.04	4.5	3.8	3.4	---	---	---	0.81	0.09

TABLE 17.--CHEMICAL ANALYSES 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)	$CaCl_2$ 0.01M (1:2)	KCl 1N (1:1)	C	Fe	Al	Fe	Al
	In		----Milliequivalents/100 grams of soil-----							Pct	Pct	mmhos/cm				Pct	Pct	Pct	Pct	Pct
Pottsburg sand:																				
S89FL-003-20-1	0-4	Ap	0.19	0.12	0.00	0.03	0.34	5.88	6.22	5	1.50	0.06	4.3	3.6	3.2	---	---	---	---	---
-2	4-8	A	0.03	0.02	0.00	0.01	0.06	3.76	3.82	2	0.69	0.03	4.9	4.0	3.8	---	---	---	---	---
-3	8-21	E1	0.02	0.02	0.00	0.00	0.04	3.27	3.31	1	0.43	0.02	5.2	4.4	4.2	---	---	---	---	---
-4	21-36	E1	0.04	0.03	0.00	0.00	0.07	3.61	3.68	2	0.39	0.02	5.5	4.6	4.3	---	---	---	---	---
-5	36-46	E2	0.03	0.02	0.00	0.00	0.05	2.94	2.99	2	0.20	0.02	5.4	4.7	4.5	---	---	---	---	---
-6	46-53	EB	0.01	0.01	0.00	0.00	0.02	2.94	2.96	1	0.18	0.02	5.3	4.8	4.6	---	---	---	---	---
-7	53-80	Bh	0.01	0.01	0.00	0.00	0.02	2.04	2.06	1	0.68	0.02	5.2	4.6	4.3	0.78	0.00	0.08	0.03	0.09
Ridgewood fine sand:																				
S88FL-003-13-1	0-4	Ap	0.29	0.10	0.01	0.03	0.43	0.79	1.22	35	1.09	0.02	4.9	4.0	3.9	---	---	---	---	---
-2	4-12	C1	0.10	0.03	0.01	0.02	0.16	1.06	1.22	13	0.36	0.02	5.5	4.7	4.6	---	---	---	---	---
-3	12-24	C2	0.05	0.02	0.00	0.01	0.08	0.20	0.28	29	0.20	0.01	5.6	4.7	4.7	---	---	---	---	---
-4	24-35	C3	0.04	0.02	0.01	0.01	0.08	0.00	0.08	100	0.11	0.01	5.4	4.6	4.7	---	---	---	---	---
-5	35-45	C4	0.04	0.03	0.01	0.00	0.08	0.00	0.08	100	0.08	0.02	5.2	4.5	4.7	---	---	---	---	---
-6	45-60	Cg1	0.04	0.02	0.01	0.01	0.08	0.00	0.08	100	0.05	0.01	5.3	4.7	4.7	---	---	---	---	---
-7	60-76	Cg2	0.06	0.03	0.01	0.01	0.11	0.00	0.11	100	0.08	0.01	5.3	4.7	4.7	---	---	---	---	---
-8	76-80	Cg3	0.02	0.02	0.01	0.00	0.05	0.00	0.05	100	0.04	0.01	5.5	4.8	4.9	---	---	---	---	---
Sapelo fine sand:																				
S89FL-003-17-1	0-6	A	0.12	0.10	0.00	0.02	0.24	3.56	3.80	6	0.80	0.02	4.7	3.7	3.1	---	---	---	---	---
-2	6-18	E	0.05	0.03	0.00	0.01	0.09	1.30	1.39	6	0.25	0.01	5.1	4.3	3.8	---	---	---	---	---
-3	18-22	Bh1	0.08	0.06	0.02	0.02	0.18	3.31	3.49	5	1.47	0.02	4.6	3.7	3.5	1.39	0.01	0.11	0.06	0.06
-4	22-26	Bh2	0.07	0.02	0.00	0.01	0.10	20.17	20.27	0	1.42	0.02	5.0	4.3	3.5	1.22	0.00	0.31	0.02	0.30
-5	26-31	BE	0.03	0.01	0.00	0.00	0.04	5.20	5.24	1	0.35	0.01	5.4	4.7	4.2	---	---	---	---	---
-6	31-48	E′	0.04	0.01	0.00	0.01	0.06	0.54	0.60	10	0.15	0.01	5.4	4.9	4.6	---	---	---	---	---
-7	48-55	Btg1	0.04	0.02	0.00	0.01	0.07	3.82	3.89	2	0.25	0.01	5.1	4.5	4.3	---	---	---	0.10	0.15
-8	55-70	Btg2	0.09	0.09	0.00	0.02	0.20	5.75	5.95	3	0.19	0.01	5.1	4.2	4.1	---	---	---	0.33	0.12
-9	70-80	C	0.08	0.11	0.00	0.01	0.20	4.00	4.20	5	0.14	0.03	5.3	4.1	3.9	---	---	---	---	---
Troup fine sand:																				
S89FL-003-8-1	0-8	A	0.50	0.15	0.03	0.04	0.72	0.39	1.11	65	0.74	0.03	5.2	4.5	4.5	---	---	---	---	---
-2	8-17	E1	0.28	0.06	0.02	0.01	0.37	0.06	0.43	86	0.34	0.01	5.6	5.0	4.9	---	---	---	---	---
-3	17-31	E2	0.33	0.08	0.02	0.01	0.44	0.00	0.44	100	0.11	0.01	5.8	5.0	4.9	---	---	---	---	---
-4	31-49	E3	0.12	0.09	0.03	0.01	0.25	0.00	0.25	100	0.07	0.01	5.5	4.7	4.7	---	---	---	---	---
-5	49-55	Bt1	0.40	0.82	0.03	0.07	1.32	2.20	3.52	38	0.17	0.02	5.2	4.2	4.3	---	---	---	0.41	0.08
-6	55-74	Bt2	0.15	0.82	0.04	0.14	1.15	4.63	5.78	20	0.15	0.02	4.8	4.0	4.0	---	---	---	1.28	0.08
-7	74-80	Bt3	0.08	0.66	0.03	0.07	0.84	2.26	3.10	27	0.71	0.02	4.8	4.0	4.0	---	---	---	0.33	0.05

TABLE 18.--CLAY MINERALOGY OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Clay minerals: Montmorillonite	Clay minerals: 14-angstrom intergrade	Clay minerals: Kaolinite	Clay minerals: Quartz
	Cm		Pct	Pct	Pct	Pct
Albany fine sand:						
S88FL-003-10-1	0-8	Ap	---	30	55	15
-4	34-40	E3	---	23	68	9
-7	65-80	Btg2	---	10	84	6
Blanton fine sand:						
S88FL-003-9-1	0-8	Ap	---	36	47	17
-3	21-40	E2	---	39	50	11
-6	73-80	Btg	---	16	74	10
Boulogne sand:						
S89FL-003-21-1	0-6	Ap	---	31	23	46
-2	6-11	Bh	---	37	13	50
-8	49-59	B'h	---	---	---	100
-10	66-80	B''h	---	---	25	75
Duplin loamy fine sand:						
S88FL-003-7-1	0-4	Ap	---	17	74	9
-4	15-27	Bt2	---	11	85	4
-6	44-70	Btg2	---	11	82	7
Hurricane fine sand:						
S89FL-003-18-1	0-3	A1	---	44	22	34
-5	24-35	E3	---	55	26	19
-8	74-80	Bh	---	25	17	58
Kingsferry fine sand:						
S89FL-003-14-1	0-7	A1	---	22	14	64
-5	43-54	Bh2	---	36	17	47
-6	54-80	Bh3	---	23	16	61
Leefield fine sand:						
S88FL-003-5-1	0-10	Ap	---	30	55	15
-4	28-35	Btv	---	25	67	8
-6	58-80	Btg2	---	8	86	6
Mascotte fine sand:						
S89FL-003-16-1	0-6	A	---	---	26	74
-3	18-20	Bh1	14	---	22	64
-4	20-24	Bh2	23	---	12	65
-7	38-52	Btg1	50	---	36	14
-9	56-80	Cg	22	---	---	78
Ocilla fine sand:						
S88FL-003-6-1	0-9	Ap	---	34	48	18
-5	32-41	Btg2	---	18	75	7
-7	58-80	Btg4	---	7	81	12
Olustee fine sand:						
S88FL-003-3-1	0-8	A	---	32	41	27
-2	8-14	Bh	---	31	26	43
-5	37-57	Btg1	---	29	66	5
-6	57-80	Btg2		12	84	4
Ortega sand:						
S89FL-003-19-1	0-3	A1	---	45	24	31
-3	6-41	C1	17	53	17	13
-6	67-80	C4	25	37	13	25

TABLE 18.--CLAY MINERALOGY OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Clay minerals			
			Montmo-rillonite	14-angstrom intergrade	Kaolinite	Quartz
	Cm		Pct	Pct	Pct	Pct
Pantego muck:						
S89FL-003-22-2	5-8	A1	---	30	52	18
-5	26-45	Btg1	38	16	39	7
-6	40-80	Btg2	34	16	44	6
Pottsburg sand:						
S89FL-003-20-1	0-4	Ap	---	30	15	55
-7	53-80	Bh	---	---	25	75
Ridgewood fine sand:						
S88FL-003-13-1	0-4	Ap	---	53	18	29
-4	24-35	C3	---	64	18	18
-6	45-60	Cg1	23	42	15	20
-8	76-80	Cg3	24	27	9	40
Sapelo fine sand:						
S89FL-003-17-1	0-6	A	---	---	26	74
-3	18-22	Bh1	---	24	18	58
-7	48-55	Btg1	---	56	28	16
Troup fine sand:						
S89FL-003-8-1	0-8	A	---	25	64	11
-5	49-55	Bt1	---	17	73	10
-7	74-80	Bt3	---	18	72	10

TABLE 19.--ENGINEERING INDEX TEST DATA

(Tests were 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 "Soil Series and Their Morphology" for the location of pedons sampled. NP means nonplastic)

Soil name, report number, horizon, and depth in inches	Classification: AASHTO	Classification: Unified	Mechanical analysis: Percentage passing sieve-- No. 4	No. 10	No. 40	No. 200	Mechanical analysis: Percentage smaller than-- .05 mm	.02 mm	.005 mm	.002 mm	Liquid limit	Plasticity index	Moisture density: Maximum dry density	Optimum moisture
											Pct		Lb/cu ft	Pct
Albany fine sand:														
(S88FL-003-010)														
E2--------18-34	A-2-4(0)	SM	100	100	98	13	10	6	4	3	---	NP	111.8	10.8
Btg1------65-80	A-2-4(0)	SM	100	100	97	33	29	24	17	16	---	NP	112.9	14.2
Blanton fine sand:														
(S88FL-003-009)														
E2--------21-40	A-2-4(0)	SP-SM	100	100	97	12	10	7	5	4	---	NP	111.3	10.1
Btg-------73-80	A-2-6(1)	SM	100	100	97	31	30	27	25	25	31	17	115.5	13.6
Boulogne sand:														
(S89-003-021)														
E2--------17-30	A-3(0)	SP-SM	100	100	88	6	5	4	4	2	---	NP	111.6	9.4
Bh--------30-38	A-2-4(0)	SP-SM	100	100	99	11	8	5	2	2	---	NP	107.2	11.8
Duplin loamy fine sand:														
(S88FL-003-007)														
Btg1------27-44	A-6(5)	CH	100	100	99	58	53	49	46	45	37	23	100.4	19.7
Hurricane fine sand:														
(S80-003-018)														
E1---------8-16	A-3(0)	SP	100	100	81	2	2	2	2	1	---	NP	111.0	10.1
Bh--------74-80	A-3(0)	SP	100	100	84	4	4	3	2	2	---	NP	109.4	10.1
Kingsferry fine sand:														
(S89FL-003-014)														
A2---------7-25	A-3(0)	SP-SM	100	100	90	9	8	6	4	3	---	NP	109.6	12.2
Bh2-------43-54	A-2(0)	SM	100	100	94	13	11	7	3	3	---	NP	104.5	13.7
Leefield fine sand:														
(S88FL-003-005)														
E1--------10-22	A-2-4(0)	SM	100	100	100	19	13	7	6	5	---	NP	109.7	11.2
Btg1------35-58	A-6(3)	SC	100	100	100	40	36	32	29	29	34	21	109.4	15.5
Mascotte fine sand:														
(S89-003-016)														
E----------6-18	A-3(0)	SP	100	100	86	4	0	0	0	0	---	NP	101.9	13.5
Btg1------38-52	A-2-4(0)	SM	100	100	99	28	25	23	19	18	---	NP	119.8	11.0
Ocilla fine sand:														
(S88FL-003-006)														
E1---------9-22	A-2-4(0)	SM	100	100	99	18	12	7	6	6	---	NP	110.3	11.4
Btg3------41-58	A-6(3)	SC	100	100	100	39	35	32	29	29	35	22	190.2	16.2
Olustee fine sand:														
(S88FL-003-003)														
Eg2-------27-37	A-2-4(0)	SM	100	100	100	17	10	4	2	1	---	NP	106.6	13.4
Btg1------37-57	A-4(0)	SM	100	100	100	36	30	28	20	20	21	9	117.2	12.6

TABLE 19.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Mechanical analysis								Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve--				Percentage smaller than--						Maximum dry density	Optimum moisture
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.05 mm	.02 mm	.005 mm	.002 mm	Pct		Lb/cu ft	Pct
Ortega sand:														
(S89-003-019)														
C1---------6-41	A-3(0)	SP	100	100	86	4	4	3	2	1	---	NP	108.6	10.5
Pantego muck:														
(S89-003-022)														
A2---------8-21	A-4(0)	SM-SC	100	100	94	55	44	31	15	9	---	NP	84.8	26.4
Btg1------26-40	A-6(0)	SM-SC	100	100	100	58	49	42	37	32	31	9	105.5	16.7
Pottsburg sand:														
(S89-003-020)														
E1---------8-36	A-3(0)	SP-SM	100	100	85	7	6	4	2	2	---	NP	113.2	10.9
Bh---------53-80	A-3(0)	SP-SM	100	100	100	5	3	2	1	0	---	NP	108.6	12.3
Ridgewood fine sand:														
(S88FL-003-013)														
Cg1--------45-60	A-3(0)	SP-SM	100	100	90	5	3	2	2	1	---	NP	108.0	10.1
Sapelo fine sand:														
(S89-003-017)														
E'--------31-48	A-2-4(0)	SP-SM	100	100	100	11	8	5	3	1	---	NP	105.1	13.0
Btg1------48-55	A-2-4(0)	SM	100	100	99	25	21	19	18	15	---	NP	118.4	11.8
Troup fine sand:														
(S88FL-003-008)														
E3--------31-49	A-2-4(0)	SM	100	100	98	13	13	7	5	4	---	NP	106.2	11.1
Bt1--------49-55	A-2-6(3)	SM	100	100	99	31	28	26	24	24	29	15	112.2	15.2

TABLE 20.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Albany	Loamy, siliceous, thermic Grossarenic Paleudults
Allanton	Sandy, siliceous, thermic Grossarenic Haplaquods
Blanton	Loamy, siliceous, thermic Grossarenic Paleudults
Bonneau	Loamy, siliceous, thermic Arenic Paleudults
Boulogne	Sandy, siliceous, thermic Typic Haplaquods
Dasher	Dysic, thermic Typic Medihemists
Dorovan	Dysic, thermic Typic Medisaprists
Duplin	Clayey, kaolinitic, thermic Aquic Paleudults
Evergreen	Sandy, siliceous, thermic Histic Haplaquods
Hurricane	Sandy, siliceous, thermic Grossarenic Entic Haplohumods
Kershaw	Thermic, uncoated Typic Quartzipsamments
Kingsferry	Sandy, siliceous, thermic Arenic Umbric Haplaquods
Leefield	Loamy, siliceous, thermic Arenic Plinthaquic Paleudults
Leon	Sandy, siliceous, thermic Aeric Haplaquods
Mandarin	Sandy, siliceous, thermic Typic Haplohumods
Mascotte	Sandy, siliceous, thermic Ultic Haplaquods
Mulat	Loamy, siliceous, thermic Arenic Ochraquults
Murville	Sandy, siliceous, thermic Typic Haplaquods
Ocilla	Loamy, siliceous, thermic Aquic Arenic Paleudults
Olustee	Sandy, siliceous, thermic Ultic 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
Pantego	Fine-loamy, siliceous, thermic Umbric Paleaquults
Pelham	Loamy, siliceous, thermic Arenic Paleaquults
Penney	Thermic, uncoated Typic Quartzipsamments
Plummer	Loamy, siliceous, thermic Grossarenic Paleaquults
Pottsburg	Sandy, siliceous, thermic Grossarenic Haplaquods
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Ridgewood	Thermic, uncoated Aquic Quartzipsamments
Sapelo	Sandy, siliceous, thermic Ultic Haplaquods
Surrency	Loamy, siliceous, thermic Arenic Umbric Paleaquults
Troup	Loamy, siliceous, thermic Grossarenic Kandiudults

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